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JUBILEE MEMORIAL



The Railway System





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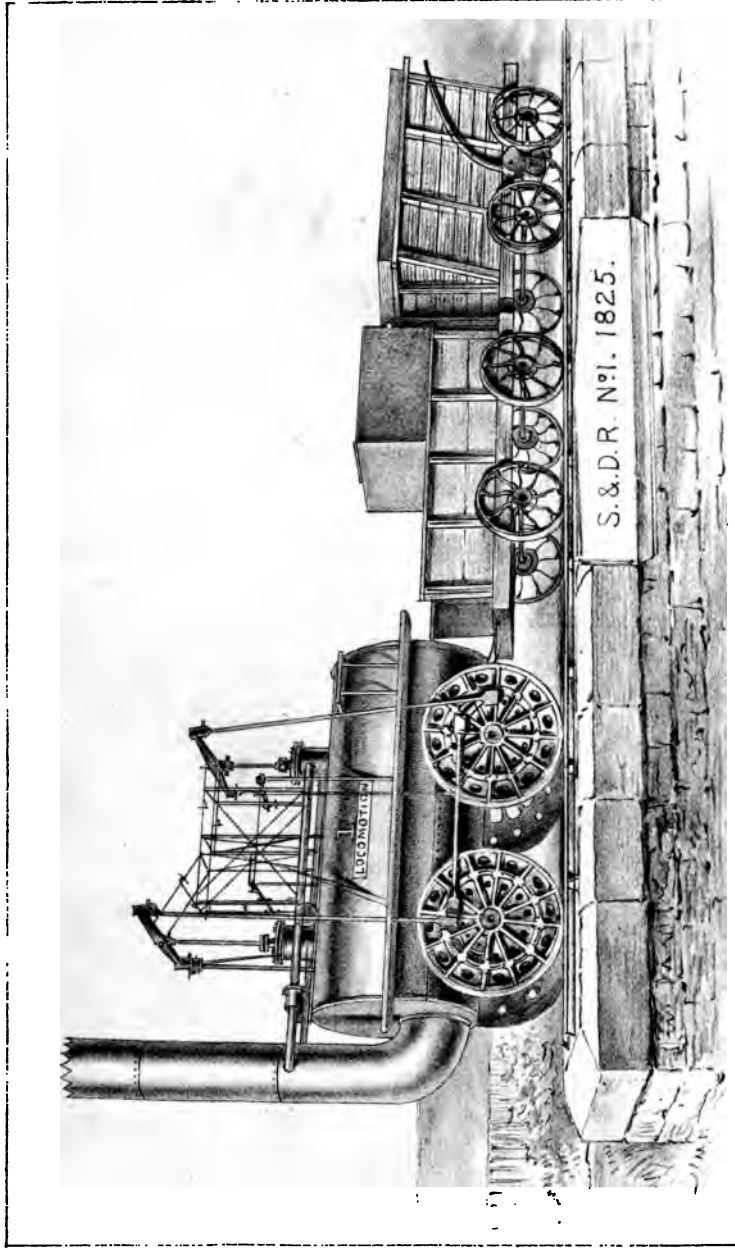
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JUBILEE MEMORIAL

OF THE

RAILWAY SYSTEM.

PRINTED BY BALLANTYNE AND COMPANY
EDINBURGH AND LONDON



The First Engine used on a Public Railway.

James A. Allen

JUBILEE MEMORIAL

OF THE

RAILWAY SYSTEM.

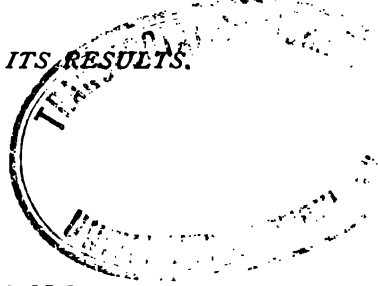
A History

OF THE

STOCKTON AND DARLINGTON RAILWAY

AND A RECORD OF ITS RESULTS.

BY
James Stephen
JEANS.



LONDON:
LONGMANS, GREEN, AND CO.

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To

HENRY PEASE;

The only surviving son of the "Father of Railways,"

the oldest Director of the first

Public Railway,

and one who has done much to facilitate

the extension of Railways,

and of Northern commerce generally,

This Volume

is

with sincere regard

RESPECTFULLY DEDICATED.

INTRODUCTION.

FIFTY years ago there were only twenty-five miles of public railroad open in the world—the Stockton and Darlington line—constructed at a cost of less than £150,000. It is estimated that there are now constructed one hundred and sixty thousand miles of railway, which, at an average cost of £20,000 per mile, represent a total sum of 3200 millions sterling.* Then there were only two locomotive engines available for use on a public railway. Now there are 50,000 locomotives in use, representing a total power equal to that of ten million horses.† Fifty years ago the railway interest employed less than three hundred hands. Now it employs more than three hundred thousand in Great Britain alone. In the year 1844—when we get fairly into the railway era—the gross annual value of the lands, railways, canals, &c., of Great Britain was only £95,300,248. In 1873, and mainly in consequence of the development of railways, it had increased to £212,922,851. Incomes from trades and professions have advanced during the same period with equally remarkable strides—their gross annual value being £65,095,191 in 1844, and £197,237,339 in 1873. From these figures, which can only be taken as approximate, we may form some adequate idea of what railways have done for the world.

When the vast magnitude and extraordinary importance

* Sir John Hawkshaw : Presidential Address to British Association.

† Dr Engel, of Prussian Statistical Bureau.

of the railway system are taken into consideration, it will appear somewhat singular, if not altogether unaccountable, that a historical record of the first public railway has never hitherto been published. And yet such is the fact. The first public railway was the Stockton and Darlington, and its formal opening took place on the 27th of September 1825—a day and occasion the jubilee of which is now at hand, and about to be celebrated with becoming pomp and dignity.

It will be admitted that a connected and accurate account of the Stockton and Darlington Railway has hitherto been a want in railway literature. Not but what something is generally known as to the antecedents of that undertaking. Fugitive and fragmentary notices of it have from time to time appeared in newspapers, magazines, and even in works of a less ephemeral character. But none could claim to be an authorised history of the undertaking, and most of them, written at a distance from the cradle of the railway system, have almost necessarily lacked coherence, completeness, and accuracy.

The occasion of the jubilee celebration of the Stockton and Darlington Railway seemed to the directors of that line to afford a suitable and auspicious occasion for supplying the greatest missing link in the literature of railways. They have, therefore, authorised and afforded all the necessary facilities for the publication of the present volume, primarily with the view of furnishing a suitable souvenir of the jubilee, but ultimately to enable those who are interested in the subject to know something more than otherwise could be known of the beginnings of the railway. In view of the favourable circumstances under which this work is published, there ought, perhaps, to be no toleration extended to apologies for deficiencies or defects. But the

time allowed to the author for the completion of the book has been very limited, and hence it may be found that it not only contains some important omissions, but also that it is not quite so perfect as to style and arrangement as the writer could have wished. However this may be, it is put forth as an honest and earnest attempt to extract from all the books and records available—whether in the possession of the railway company or otherwise—the essence of what is generally interesting in respect of the beginnings of the railway system. It can also be claimed for the facts and figures—and this is no slight merit—that they have all been compiled from official and accredited sources, so that their accuracy may be accepted as unimpeachable.

General histories of the railway system have been written over and over again. Individual railways, moreover, have had their individual historians, from the time of Mr Booth (who published in 1830 his “Historical Account of the Liverpool and Manchester Railway”) down to the present date. An exhaustive review of the progress of railways at home and abroad will not, therefore, be attempted in the following pages. Such a theme would demand limits far in excess of those prescribed for this volume, and would involve pretensions to which it can lay no claim.

But it will be necessary to deal briefly with the antecedent events which ushered in the dawn and facilitated the development of the railway system, as well as to review some of the consequences that have followed from that development. Looked at from this point of view, it may fairly be argued that the history of the first public railway has gained by lapse of time. Had it been attempted earlier, the historian might, indeed, have laid a more elaborate foundation, but he could not have raised such a

wonderful superstructure. Not even the most sanguine exponent of the merits and advantages of the railway system could have foreseen, at any time within twenty years after the germs of success had taken root at Darlington, that the extent and importance of railways would have become such as they now are. Their progress has transcended all that was ever hoped for or believed in. The past and the present are now sufficiently within the range of our knowledge to enable us to judge of the future, and to appreciate, more justly than could possibly have been done at any previous date, the momentous and far-reaching results of the work that was consummated by the pioneers of the first public railway on the 27th of September 1825.

It will probably not prejudice the historical value and interest of this work that it contains brief biographical sketches of the pioneers of the railway system, and a short historical and industrial sketch of the birth-place of railways. In each of these divisions the reader will find reminiscences and facts that could not with equal propriety have been introduced in the first division.

The author's best thanks are due and are hereby tendered to Mr Edmund Backhouse, M.P., Mr Henry Pease, Mr David Dale, Mr J. E. Macnay, Mr Hugh Dunn, Mr John Glass, and others who have rendered ready aid in furnishing the materials of which the volume is composed.

J. S. J.

DARLINGTON, *September 1875.*

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DIVISION I.



HISTORY OF THE STOCKTON AND
DARLINGTON RAILWAY.



JUBILEE MEMORIAL

OF

THE RAILWAY SYSTEM.

CHAPTER I.

BEFORE THE RAIL.

IT will require no ordinary effort on the part of those who belong to the present generation to realise the inconvenience and awkwardness that attended the condition of things by which the railway era was preceded. We have now become so accustomed to the luxury of railways, that we can hardly estimate their true value and importance, even when we strive to actualise what our commerce and our comforts would be without them. Still more difficult will it be for many to assess the full significance of the fact that it is no more than fifty years since the first public railway was opened. Something may easily be known of what has been done in the way of railway development during that period. Blue-books and statistical reports make us familiar with the fact that railways have covered the surface of the habitable globe like a net-

work; that they are everywhere considered and found to be essential to the attainment and the maintenance of a high degree of civilisation; that communities languish where they have not penetrated, and that their growth has been synchronous with the greatest and most marvellous extensions of population and industry on record. Never did the sounding of the tocsin or the lighting of the beacon-fires more readily and effectually change the tendencies of a people than the extension of railways has altered the appearance and tendencies of the localities favoured by their presence.

But to the generation that lived only fifty years ago these things were a sealed book. People, for the most part, lived in a happy, optimist faith, and were satisfied with things as they found them. The promulgation of the possibility of superseding the old stage-coach would have been but as sounding brass and a tinkling cymbal. Superstition had not been altogether exorcised, and there were even those who regarded any innovations on the usages of their forefathers as a tempting of Providence, so flagrant and rash as to bring down a sure judgment on the heads of the innovators. "Whatever is, is right," was the prevailing creed, —a creed which was then, as it always has been, opposed to the genius and subversive of the spirit of true progress. People were content with things as they were, because they had not been accustomed to anything better. It is surprising how few had realised the possibilities of steam locomotion before it had actually become an accomplished fact. A glimmering of the possible application of steam as a motive power had dawned on inventive minds long before the time of Watt; and the Marquis of Worcester, in his "Century of Inventions," written in 1655, had

shadowed forth all, or nearly all, that Watt was the instrument of achieving. Electricity had made its power felt long before the telegraph was successfully established, and there were many minds directed to the solution of telegraphic communication before that achievement had taken its place in the annals of discovery. The invention of printing had been foreseen and attempted long before the time of Caxton, or Gutenberg, or Faust, or Schœffer; and to this day it is claimed that neither of these men, but Laurentius of Hærlem, was the real inventor of printing. Even the discovery of the circulation of the blood was disputed with Harvey by Father Paul, and it was even maintained that the discovery was as old as the time of Hippocrates. But while we find, on looking into the pages of human history, that there were rival claimants for nearly all great discoveries and inventions, or that, if there were not those who claimed the merit of authorship, there were at any rate those who claimed to have foreseen what came to pass—so easy is it to be wise after the event!—it is a somewhat curious fact that we have no record extant of any one whose prescience could discern the full ultimate outcome of the railway system. It is essentially a modern invention, alike in its inception and in its execution. It is altogether a product of the nineteenth century, and the greatest product that that greatest of all the centuries has bequeathed to posterity.

The comparatively recent introduction of the railway system is all the more remarkable when the urgent necessity for their adoption is taken into account. That necessity existed in the great Northern coal-field to a greater extent than in any other. In Yorkshire, Nottingham, Derbyshire, Staffordshire, Lancashire, South Wales,

and elsewhere, there were numerous canals intersecting the country, and used for the purpose of carrying coal. In Lancashire, Cheshire, and North Wales there were not less than forty-two Acts passed for the construction of canals previous to 1800. We find, again, that from 1503 to 1796 not fewer than thirty-four Acts were passed for the construction of canals in Somersetshire and Gloucestershire, while in the same period sixty-one Acts were passed for the construction of canals in Yorkshire, Nottingham, and Derbyshire. But the Royal Assent had been obtained to only six Acts for constructing canals in the Northern coal-field. One of these was for the Foss Navigation, in 1793, and the remaining five were for the navigation of the Wear, in 1716, 1726, 1747, 1759, and 1785 respectively.* It is true that Durham and Northumberland, having the command of three navigable rivers—the Wear, the Tyne, and the Tees—and the ports of Newcastle, Seaham, Hartlepool, Blyth, Sunderland, Stockton, and Berwick, were much better off for carrying facilities than more inland districts. But this very circumstance hindered the development of canal navigation, and thus prevented the growth of the coal-trade except on the sea-board, or within easy distance of river navigation. Hence we find that up to the year 1820 the majority of the collieries opened out in both Durham and Northumberland were geographically situated near to or within easy access of shipping facilities, while the difficulties attendant upon transport retarded the progress of the South Durham coal-field, whose produce was then represented by thousands, where it is now represented by millions, of tons per annum.

* See Report of Coal Commission, 1871, App. to vol. iii.

Prior to the introduction of the railway system, the coals were usually conveyed from the inland collieries on packhorses, mules, and asses. They were placed in bags slung across the backs of these animals, just as it is still the custom in South America to employ mules or other beasts of burden to convey the wool of the alpaca and agricultural produce from the interior to the coast. The time when large numbers of horses and mules were used for the conveyance of coals along roads that were impassable by carts is still within the memory of living men. The public highways were gradually improved, and carts simultaneously came into general use, the usual load for a horse yoked to a cart being about one ton, conveyed from nine to ten miles a day. The first improvement upon this state of things took place about the year 1632, when the load was increased to two tons on one wagon, and sometimes, on a favourable gradient, the load was increased to four tons on two wagons. But owing to their expense, and the difficulty of their construction elsewhere than on level ground, wooden ways were the exception, and continued to be so until the close of the last century.

Land-sale pits, in the earlier days of the coal-trade, were generally situated at or near the outcrop of the coal, in elevated and rugged localities. In coming down the hill, therefore, it was not a difficult thing for one horse to drag two wagons, and this duty he was generally required to undertake. In not a few cases, however, it was found necessary to employ an extra horse to pull up the empty wagons. Mention is made of one firm on the Tyne that employed more than 350 horses in the conveyance of their coals from the pits to the river, from whence they were

conveyed in barges or keels to the ships destined for their transport.*

This expensive and inconvenient condition of things was somewhat amended by the introduction of cast-iron rails, which were first made use of at the collieries in Durham and Northumberland about the year 1794. The usual load for a horse on the cast-iron roads was from ten to twelve tons on a level or slightly-inclined road; while the distance was increased from ten miles per day on an ordinary turnpike road to twenty and twenty-four miles on the railroad.

The locomotive resources of the district were still, however, very far from satisfactory; and many suggestions were made and schemes projected for lessening the cost of carriage. Messrs Wood and Taylor, two of the most experienced and competent men in the Northern coal-trade, calculated that previous to the introduction of tramroads the old packhorse conveyed three cwt. at three miles per hour, and travelled on an average about eight miles with his load. The cost of this mode of conveyance was about 1½d. per cwt. per mile, or about 2s. 6d. per ton per mile, so that if the coals had to be carried a distance of six miles, there would be a tax of 15s. per ton for carriage alone. This heavy cost was reduced to 8½d. per ton per mile by the introduction of macadamised roads, which increased the horse-load from three to eighteen cwt.; and on the early wooden tramroads the cost of haulage was still further reduced to 3½d. per ton per mile—the horse-load, as already indicated, averaging about two tons. But careful and accurate calculations made by the same gentlemen from unquestionable data show that the immediate

* Industrial Resources of the Tyne, Wear, and Tees.

cost of actual haulage on private railways, exclusive of interest on capital and wagons, in cases where horses, inclines, and fixed engines are intermixed as circumstances require, is no more than '07d. per ton per mile.

It is scarcely necessary to extend our examination of the practical difficulties of the pre-railway era into the antecedents of the old stage-coach. That time-honoured and venerable institution has long been relegated to the limbo of obsolete and disused appliances; and many a dirge has been sung and many an epitaph written *in memoriam* of its achievements. Suffice it to say, that up to 1763 only one stage-coach ran between Edinburgh and London, starting once a month from each of these cities. It required ten days to make this journey in summer, and twelve in winter. The same journey can now be performed in less than nine hours. Nor need we speak of the many accidents and delays to which the old stage-coach traveller was liable, "the hairbreadth escapes by flood and field" which he was ever and anon called upon to encounter, the contingencies attached to wind and weather, and the consequent uncertainty as to when his journey would come to an end. All these and cognate conditions of travel are still too recent and too well known to require exposition within fifty years after the opening of the first public railway, which sounded their death-knell at once and for ever.

CHAPTER II.

THE DAWN OF THE NEW ERA.

IT is a common error to suppose that there were neither railways nor locomotives before the era of George Stephenson, Edward Pease, and the Stockton and Darlington Railway. The fact is, that mechanical locomotion, by the adhesion of the rim of a loaded wheel to the surface upon which it rolled, while being forced to revolve by some tangential force, is very old.* Camus, who was born in 1672, and died in 1732, had in 1729 made an automaton coach and horses for Louis XIV. Other mechanics had made automata which were supplied with power by the relaxation of a wound-up spring.

We find, again, that in 1759 the possibility of producing locomotion on land by steam-power was suggested by Dr Robison of Scotland; and in 1772 Oliver Evans, in America, promulgated the same theory in relation to the engine with which his name is identified.

James Watt, the principal inventor of the steam-engine, patented in 1784 an application of his engine to the movement of carriages. His patent, however, was allowed to lapse without coming to any practical result, and it has been contended by men of science that the condensing-engine, which was Watt's special favourite, was not quite applicable to locomotive purposes.

* *Vide Practical Mechanics' Journal*, May 1865.

Symington, again, proposed steam locomotion in 1784, and actually succeeded in applying it to the purposes of navigation, under the auspices of Mr Millar of Dalswinton, in Dumfriesshire. In the following year Symington prepared plans for the construction at the Carron Works of an engine of twelve-horse power; and this engine, when fitted up in a strong boat, succeeded in drawing barges along the Forth and Clyde Canal at the rate of nearly seven miles an hour.

In 1802-3 Trevethick completed a high-pressure locomotive engine, which was considerably in advance of anything that had been accomplished up to that time. This engine was in 1804 tried on a railway in Wales, but was abandoned on account of mechanical defects. It is, however, claimed for Trevethick that he was the first to observe the value of the draught produced by the escape steam in the chimney, and that at this period he fully knew and asserted that the increase of speed upon a railway was only a question of increased production of steam. It is said * that the engine erected by Trevethick had only one cylinder and a flywheel to secure rotary motion at the end of each stroke. An engine of this sort was sent to the North for Mr Blackett of Wylam, but for some cause or other it was never used upon his railroad; and it was eventually applied to blow a cupola at an iron-foundry in Newcastle.

In 1811 Mr Blenkinsop took out a patent for a locomotive engine, working by a rack or toothed rail, which was employed at the Middleton Colliery, near Leeds, in 1812; and an engine of this description was employed on the Cox Lodge Colliery Railway in 1813.

* Nicholas Wood on Railways.

About this time a great amount of mechanical ingenuity appears to have been bestowed on the attempt to solve the problem of steam locomotion. Mr Nicholas Wood speaks of an engine constructed by Chapman, which was worked by an endless chain, and which was placed on the Heaton Colliery Railway in 1813. Another engine, constructed or designed by Mr Hedley of Wylam, commenced working on the Wylam Railway in the early part of the same year. This railway was a cast-iron tramroad; and Mr Hedley, being doubtful whether the adhesion of the wheels upon the railway was sufficient for the engine to propel itself and also a load forward, had some experiments made for that purpose on the Wylam Railway. The result was, "that the friction of the wheels of the experimental carriage (constructed specially for the purpose) alone upon the rails, when it approached to the weight of an engine carriage, was sufficient to enable it to overcome the resistance of an attached train of carriages."*

It may be noted that Mr Hedley's "Puffing Billy" is now exhibited in the Patent Office Museum, South Kensington, as "the oldest engine in existence." It was in constant operation until its removal from Wylam to the Patent Office Museum on the 6th of June 1862.

The first locomotive engine which propelled itself by the adhesion of its wheels on the round top-rails was erected at Killingworth, and tried on the railway connected with that colliery on the 27th July 1814. The steepest gradient on that line was 1 in 450, and this the locomotive ascended with eight loaded wagons, weighing in all about thirty tons, at the rate of four miles an hour. This engine was the result of the joint experiments and

* *Vide* Who Invented the Locomotive? by Mr Hedley.

amalgamated skill of George Stephenson and Nicholas Wood. The latter tells us that "soon after Stephenson had become established as engineer to the partnership collieries in 1813, his attention was drawn to the cost of conveying the Killingworth coals by horses, where one horse only took three chaldron wagons, or about eight tons of coals, at a time. He had inspected the locomotives at Heaton and Cox Lodge, which had been abandoned, and that at Wylam, which was at work; and with this limited information of what had been done, he set to work to construct an engine of his own. The first question that presented itself for solution related to the adhesion of wheels upon the round top-rails; and several experiments were made by Stephenson and myself as to the adhesion on such rails. Having been satisfied on this point, Stephenson discarded any extraneous assistance to propel the engine forward, such as was employed by Chapman, Brunton, or Blenkinsop, simply coupling all the engine-wheels together, so as to have the adhesion of the sole weight of the engine." *

For nearly fourteen years, therefore, previous to his undertaking the construction of the Stockton and Darlington Railway, George Stephenson had not only identified himself with the improvement of locomotive engines, but had successfully applied steam locomotion to colliery purposes. During that interval many successive improvements were made upon the locomotive engine. Cog-wheels were first superseded by an endless chain, and afterwards by a system of cranks with side-rods. Stephenson also applied two cylinders in his Killingworth engine,

* Transactions of the North of England Mining Engineers, vol. viii. p. 49.

improved the mode of communicating the action of the pistons to the driving-wheels, and was responsible for the application of the power of adhesion on the round top-rails to propel the engine and its load, without the intervention of racked rails or other contrivances used to propel the engine forward.

It was not, however, by the improvement of the locomotive alone that Stephenson hastened the inauguration of the railway system ; there were many other economic and mechanical difficulties to conquer. The mode of constructing and laying down lines of rail was susceptible of immense advances towards perfection. Long previous to Stephenson's time, lines of railway were employed at collieries and elsewhere for the purpose of facilitating and lightening the labours of man and beast. The colliery wagon-ways already referred to date as far back as 1602, when they took the shape of "wooden railways." From 1670 these wooden railways were in general use. In 1738 cast-iron rails were adopted, in three-feet lengths ; these were first of all used in the form of tram-rails. Next came round top-rails of cast iron ; and, finally, malleable iron rails of fifteen-feet lengths. In 1777 Curr of Sheffield introduced underground-rails for colliery purposes in lieu of sledges. In 1794 cast-iron rails were partially used on the railway belonging to Walbottle Colliery. It was not until 1815 that malleable iron rails began to be used instead of cast iron.

Wood tells us that in 1813, when Stephenson was appointed engineer at Killingworth, the only rails used were made of cast iron, three feet in length, with square joints, weighing from thirty-two to forty lbs. per yard, and just of sufficient strength to carry a chaldron wagon loaded

with fifty-three cwt. of coal, or a gross weight of four tons. In order to prevent the shock to the wheels by the square joints, Stephenson patented, in conjunction with Mr William Losh, of the Walker Ironworks, a rail with half-lap joints, or with one half of the end of the rails cut away longitudinally for about two inches. Hence, when the ends of the two rails were laid together, they were the same breadth of top at each joint as the solid part of the rail, and thus the shock to the carriage was obviated. Improvements were also made by Stephenson in the construction of railway chairs and wheels.

From all that has been already stated, it will be seen that practical men in the district which was ever afterwards to be distinguished as the cradle of the railway system had applied themselves earnestly and laboriously to solve what has since proved to be the greatest mechanical problem of the age. How that solution was finally and effectually consummated must be told in succeeding chapters.

CHAPTER III.

PRELIMINARIES TO THE FIRST PUBLIC RAILWAY.

WHILE Stephenson, Nicholas Wood, and others were making experiments with a view to the more effectual and extended application of locomotive power, events were gradually ripening for the construction of the first public railway. "There is always," says an old writer, "noticeable in all lives of mark and credit that it was not alone the man for the time, but the time for the man that made distinction." That this was largely true in Stephenson's case can hardly be gainsaid. A long controversy had taken place, and was still pending, as to the most easy and advantageous way of improving the carrying facilities of the Durham coal-field. In the spring of 1805 it was determined to shorten the channel of the River Tees by constructing a "cut" at Portrack, near Stockton, with a view to improving the navigation of that river. For this purpose a committee was appointed, of which Edward and Joseph Pease, sen., were members. In 1808 an Act was obtained for the carrying out of the "cut," and the work was completed, and its opening celebrated by a dinner held in the Town Hall of Stockton on the 18th of September 1810. Advantage was taken of this event to inaugurate a movement for the construction of a railway or canal from Stockton by Darlington to Winston, for the benefit of the mineral and other traffic of South Durham

and North Yorkshire. The same ground had been surveyed in 1768 with a view to constructing a canal, but the project came to naught. This committee in the following year affirmed that either a canal or a railway would be productive of much advantage to the proprietors, and proposed to report thereon to "a meeting of gentlemen, merchants, and others who were desirous of promoting the undertaking," to be held in the King's Head Hotel, Darlington, on Friday the 17th day of January 1812. At this meeting it was resolved to employ Rennie, the eminent engineer, to make a survey of the ground before resorting to any further measures.

The practical scope and purpose of this work would not be promoted by going very minutely into the history of the movement that culminated in the determination to construct the Stockton and Darlington Railway. For several years public opinion was divided as to whether a railway or a canal would at once be more likely to further the interests of commerce and the advantage of its proprietors. Nor is this conflict of opinion so remarkable as it may seem on the face of it. The circumstances of the time were peculiar. Up to that date no locomotive had been made that could attain a greater speed than four or five miles an hour, whereas steam navigation had many years previously reached the rate of seven miles an hour.* The railway consequently offered no apparent advantage in point of speed. Neither should it be forgotten that there was not at that time any widespread or generally-accepted idea in favour of making railways supersede the old stage-coach. They were designed mainly, if not exclusively, for the better and more expeditious carriage of goods and

* *Vide* The Steam Fleet of Liverpool, by John Willox, 1865.

minerals. It was only reserved for a few men, whose prevision and foresight elevated them into the ranks of apostolic fame, to discern the germs of possibility that lay concealed in the matrix of the future.

From one cause or another the project was all but allowed to sleep for some years. In 1818, however, it was vigorously revived by the advocates of the canal scheme, at whose instance a public meeting, convened by the Mayor of Stockton, was held in that town on the 31st of July. Over this meeting the Earl of Strathmore was called to preside. The principal speaker appears to have been Mr Leonard Raisbeck, who was solicitor to the Tees Navigation Company, and who is reported to have recommended that the projected canal should commence at the north end of Stockton, and proceed by Darlington to Winston Bridge, near Barnard Castle—the course suggested by Rennie in 1813, and by Whitworth in 1768. “One consequence,” said Mr Raisbeck, “of the projected connection with the river at Portrack I cannot forbear to particularise; and that is, that it must produce a most serious injury to the three principal towns of this port, by withdrawing the trade from them. Perhaps, if further inquiry be instituted, *this objection* may be *obviated*, and the *combined advantages* of the two lines referred to be obtained, by making the canal *originally* suggested, with a railway to it from the field of coal from which so rich a harvest is looked for; or should that not be deemed advisable, the wishes of the present projector, whose only object appears to be the acquisition of coal, may be accomplished by means of a railway at one half the expense of a canal, which, according to the opinion of Mr Rennie, is in general unnecessary in cases where the *principal car-*

riage must proceed from *one extremity only*. Under these circumstances, I presume to move that a committee be appointed to inquire and report *which* of the undertakings alluded to will *most extensively* promote the general interests and commercial connections of the port."

Subsequent events have proved that Mr Raisbeck did not exaggerate the possible results of the communication then contemplated, although these results did not happen exactly in the manner that he foreshadowed.

The estimated cost of the canal projected from the Tees to the Auckland coal-field was put down by the committee at £205,283, or more than double the estimated cost of the railway. This sum was made up of £95,600 for the main canal from the Tees at Stockton to Darlington; £83,978 from Darlington to Winston Bridge; £8256 for a branch to Yarm; £10,016 for a branch to Croft Bridge; and £7768 for a branch to Piersebridge.* The revenue which was expected from all sources was £57,850—namely, £25,000 from land-sale coals; £25,000 from the sea-sale coals; and £7850 from lime and other articles of traffic.

It was, however, pointed out at the time that this calculation of revenue was greatly overstated. It was assumed that the annual vend of coal was then 185,000 tons in the district whose traffic was relied upon. As a proof of the unreliable character of the estimate, an opponent of the scheme published the fact that whereas the committee had taken the annual vend of the Eden Main Greenfield Colliery at 35,000 tons, the actual vend was not more than 21,000 tons, or 5000 score of coals, at 83 cwt. to the score. This writer reduced the 185,000 tons of coals estimated by

* These figures have been copied from the original estimate in the possession of Mr J. E. Macnay.

the committee to 111,000, of which he only allowed 37,000 tons for the canal—namely, 20,000 tons to Stockton, and from thence by land carriage into Yorkshire; and the remaining 17,000 tons he allowed for distribution in the adjacent district on each side of the canal. The revenue from these 37,000 tons he estimated at £8312, or something less than one-third the amount estimated by the committee.

Other parts of the committee's report were analysed and animadverted on in a similar manner. They had calculated on a large export trade in Sunderland coals, and represented Harraton Main and Beamish South Moor coal to be 21s. 6d. per chaldron, whereas they were only 18s. per chaldron. They published the coal-owner's price for West Auckland coals at 12s. per chaldron at the pits, and proposed to take them to the canal for 1s. 6d. per chaldron more, making 13s. 6d. for the coal-owner's price put into craft in the canal. This was exactly the price of Sunderland coals put into keels on the Wear, but then the cost of conveyance to the ships at the mouth of the Wear was not more than 3s. 6d. per chaldron, whereas the cost of conveying the coals along the canal to a ship on the Tees was put down at 14s. 7d. per chaldron, and this sum added to the 13s. 6d. for which the coals were to be delivered on the canal, made up a total sum of 28s. 1d., or 6s. 7d. per chaldron above the cost at Sunderland.

Not less flagrant blunders and misstatements were to be found elsewhere throughout this report. The committee calculated on a return equal to 28 per cent. on the capital invested. As opposed to that calculation, a clever statistician, after examining carefully the various sources of expected income and necessary expenditure, showed that if the canal scheme were carried out, the directors

could not expect more than one per cent. on an outlay of £300,000 for the first thirty years.*

"Look," said the writer, "at the country all the way between the two places—Auckland and the Tees. Take its manufactures of woollens, cottons, earthenware, iron—its coals for the supply of the different manufactories, and these all in active employ from the very beginning of the work. Then look at the project; we have a most unfavourable country to pass over; there must be fifty locks in less than thirty miles. . . . Then look at the population. Where are the inhabitants? A few thinly-scattered farmhouses; no manufactories; little commerce; and when we get to the collieries, what are they?"

If the writer had chanced to live in the year of grace eighteen hundred and seventy-five, he would not have had occasion to speak of South Durham as he did. The thinly-scattered farmhouses have been transformed into populous towns. The inhabitants whom he seems to have sought in vain are now teeming in a hundred busy hives of industry. The "little commerce" which he deprecated has swollen out into a production closely approaching eighteen million tons of coal per annum, and a metallurgical industry now universally admitted to be the foremost in the world. While, last but not least, the collieries respecting which he contemptuously asked, "What are they?" have been made equal to the production of more coal than those of any other coal-field in the world, and furnish regular employment to more than forty-five thousand hands.

Like the plan of 1768, which terminated the proposed canal at Winston, the scheme of 1818, which had its two termini at Stockton and Evenwood Bridge, near Bishop

* Letter by "Alexis."

Auckland—a total distance of twenty-seven miles—came to naught; and will only live in history, if it lives at all, as a lame and impotent attempt to thwart the progress of the railway system, by which it was very fortunately superseded.

CHAPTER IV.

THE BEGINNINGS OF THE RAILWAY.

FROM a quaint record which now lies before us, we find that on Friday, the 13th day of November 1818, "a highly respectable meeting was held in the Town Hall at Darlington, for the purpose of taking into consideration the committee's report on the survey taken a few years ago by Mr Rennie for a canal, and more lately by Mr Overton for a railway, between Stockton and the collieries in the Auckland district, by way of Darlington."

Over this meeting Dr John Ralph Fenwick was called to preside. The reports of Mr Rennie relative to the canal scheme, and of Mr Overton in favour of the railway project, were separately read. At the same time there was submitted to the meeting the report of the committee appointed at a meeting held at Darlington on the 4th September immediately preceding to consider the relative merits of the two schemes—"which being done, and the committee's report having been previously printed and distributed, the whole were taken into consideration."

It is interesting to note that the principal speakers on this vital occasion were Mr Jonathan Backhouse, Mr Edward Pease, Mr John Grimshaw, and Mr William Stobart, junior, each of whom strongly recommended the adoption of a railway in preference to a canal.

The speech of Mr Jonathan Backhouse was full of facts

and figures, which he used with sledge-hammer effect to demolish the arguments and calculations of those who advocated the canal scheme. After speaking with just scorn and ridicule of the absurd pretensions and exaggerated claims of the canal promoters, he went on to say, "Now, our railway committee say that 20,000 tons is all they have calculated upon for Stockton, and what goes through that place to Cleveland; and this quantity, at 3d. per ton per mile for twenty miles, comes to £5000; and that, on the expenditure of £225,000, you will find comes to about $2\frac{1}{4}$ per cent. This added to the former calculation of $1\frac{1}{2}$ makes, for both these items thus taken, $3\frac{1}{2}$ per cent. But they say that they expect 100,000 tons more for the home consumption. On what foundation this estimate rests I must leave the gentlemen of Stockton to find out. If it be correct I shall be glad. But what does it prove? Why, it must clearly demonstrate that, instead of our having 15 per cent. on the railway, we shall have 25 per cent. upon it; for if they can vend 100,000 tons by the home trade through Stockton alone, how much must we vend when we have Piersebridge for Richmond, Croft Bridge for Northallerton, and part of Cleveland, Thirsk, &c.; the town of Yarm and Yarm Bridge for Cleveland, as well as the town of Darlington itself, in addition to their boasted quantity of 100,000 tons; and what reason can be assigned why we should not do this as well as they? . . . Now, I think I have proved to you that we have fair grounds to expect a greater revenue from the railway than they can expect from the canal." The speaker commended the committee for the moderation of their estimates, contending that they had most carefully avoided holding out prospects which experience

might afterwards contradict ; and, in conclusion, he maintained "that this scheme holds out the most decided advantages over the Auckland line, and not only confers very great benefits on almost the entire population of the south and east parts of the county, but will also very much extend our intercourse with the North Riding of the county of York ; so that, on whatever side we view it, whether as a public benefit or as a private adventure, it powerfully urges the undertaking, and affords a rational and well-grounded expectation of an ample reward to the subscribers."

Mr Edward Pease more than corroborated the conclusions of Mr Backhouse. He pointed out that the tolls on the coal-road from Darlington to the collieries were let for £2000 a year, and as the average charge for a single-horse cartload (which was rather less than a ton) was sixpence, and the distance was about twelve miles, this was a rate equal to one halfpenny per ton per mile. "Now," said Mr Pease, "if a halfpenny per ton per mile, as now paid, produce £2000 a year, then three halfpence per ton per mile, the sum proposed to be charged for rail dues, must produce £6000 a year. You need not go any further. This quite satisfies me. That revenue on this short piece of road yields me 5 per cent. on the outlay, and this is enough. . . . Some perhaps can make it out to be 6, or 8, or 10, or 12 per cent.—I do not know how much—but there is ample room for calculation ; but I am quite satisfied with my 5 per cent. ; and I have only made this statement to show that by one single article we can make a sufficient rate of interest by this undertaking, and all the rest may be taken as profit over and above 5 per cent."*

* *Vide* Appendix I.

So far as we have been able to ascertain, the only prospectus that was ever issued of the Stockton and Darlington Railway Company was drawn up at this meeting, and took the shape of the following resolutions :—

“The reports of Mr Rennie and Mr Overton, and of the committee, having been taken into consideration,

“Resolved,—

“1. That this meeting approves of the general views expressed by the committee in their report.

“2. That a rail or tramway throughout the entire line between Stockton and the collieries, with branches communicating with Piersebridge, Croft, and Yarm, is, under existing circumstances, preferable to a canal; that such a communication would be highly advantageous to the interests of the south and east parts of the county of Durham, and of Cleveland and other parts of the North Riding of Yorkshire, as well as profitable to those who engage in the undertaking; and that it is of importance to carry it into effect with as little delay as possible.

“3. That an application be made to Parliament for an Act for a tramway, on the plan and estimates given by Mr Overton.

“4. That a subscription be immediately entered into for raising the sum of £92,000, the estimated expense of the main line; and the further sum of £32,000, the estimated expense of the branches, making a total of £124,000, in shares of £100 each, of which an advance of £1 per share, not exceeding £10 for ten shares or upwards, be paid at the time of subscribing, and the remainder at such times and in such proportions as shall be determined by the committee of management; but that the instalments shall not exceed £10 per share, nor be made at shorter intervals than three months. That such deposit and instalments be appropriated by the committee for the purposes intended, and be in the meantime lodged in such bank or banks as they may from time to time direct.

“5. That books be opened for subscriptions at the several banks in Darlington, Durham, Stockton, Newcastle, Sunderland, Thirsk, York, Richmond, and Whitby; and at the banking-houses of Messrs Barclay, Tritton, & Co.; Esdaile & Co.; Masterman, Peters, & Co.; Hoarce & Co.; Pole, Thornton, & Co.; Curtis, Roberts, & Co.; Sikes, Snaith, & Co.; and Glynn & Co. in London; and at such other banking-houses as the committee of management may appoint;

that the names of subscribers, with the number of their shares, the deposits paid, and the time of payment, be entered in a book kept for the purpose ; and that at all future general meetings every subscriber shall have a vote for each share of £100 which he holds in the undertaking to the extent of ten shares, and one vote for every two shares exceeding ten, and shall be entitled to vote by proxy, to be appointed in writing.

“ 6. That the following gentlemen—namely, the Right Hon. Lord Dundas, the Hon. Thos. Monson, Samuel Crompton, Esq., Henry Pierse, Esq., Warcop Consett, Esq., Thos. Meynell, Esq., Marmaduke Wyvill, Esq., John Ralph Fenwick, Esq., William Chaytor, jun., Esq., Benjamin Flounders, Esq., John Allan, Esq., Henry Walker Yeoman, Esq., Thos. Stapylton, Esq., Thos. Sampson, Esq., R. W. C. Pierse, Esq., Thos. Davison, Esq., the Rev. Archdeacon Hamilton, the Rev. Henry Hardinge, Robert Walker, Esq., John Saunders Walton, Esq., Josiah Morley, Esq., Thos. Backhouse, Esq., Mr Jonathan Backhouse, Mr Edward Pease, Mr Edward Backhouse, Mr John Pease, Mr James I’Anson, Mr C. Dove, Mr George Middleton, Mr William Cudworth, Mr Robert Botcherby, jun., Mr Brightwass, Mr Jervis Robinson, Mr Richard Mills, Mr Cuthbert Wigham, Mr John Grimshaw, Mr Jeremiah Cairns, Mr Matthew Wadeson, Mr William Richmond, and Mr Richard Jackson, or such of them as shall become subscribers to the undertaking, and all subscribers of £500 and upwards, be appointed a committee of management (of whom any seven shall be competent to act) to carry the object of this meeting into effect. . . .

“ 7. That the following gentlemen (of whom any five shall be competent to act) be requested to form themselves into a committee in London for obtaining subscriptions, with power to add to their number—namely, Thomas Richardson, Esq., Samuel Gurney, Esq., Robert Barclay, Esq., David Bevan, Esq., John Overend, Esq., Aaron Chapman, Esq., John I’Anson, Esq., William I’Anson, Esq., W. M. Dollin, Esq., Mr Thomas Wilkinson, and Mr John Kitching.

“ 8. That in the event of a sufficient sum being subscribed, the bill for carrying into effect the proposed rail or tramway be forthwith prepared under the direction of the committee of management ; but that if the requisite proportion be not subscribed before the latest day appointed by Parliament for receiving private bills, every subscriber shall have the option of withdrawing his subscription on signifying his intention to the solicitors.

"9. That Mr Jonathan Backhouse, jun., be appointed treasurer for receiving the deposits.

"10. That an extension of the rail or tramway into the North Riding of Yorkshire, in the direction of Richmond, of Northallerton, and of Guisbrough, appears to this meeting to be deserving the most serious attention; and that one important advantage of the southern line of communication arises from the facilities which it affords to such extension; and that the committee of management be therefore authorised to direct such surveys to be made as they may deem most advisable for the purpose.

"11. That the committee of management be recommended to endeavour to ascertain how far it will be eligible to shorten the line of the intended rail or tramway, by the aid of machinery or other means.

"12. That these resolutions be printed in the *Times* London newspaper once a week for three successive weeks, and three times in the *Durham County Advertiser*, and in all the York and Newcastle papers."*

A good deal of doubt prevailed about this time concerning not only the best route for the railway, but also the calculated cost. On the latter point, Mr Mewburn, as solicitor to the promoters, interrogated Mr Overton, engineer, and received the following reply:—

"LANTHELLY, near BRECON, SOUTH WALES,
20th Oct. 1818.

"SIR,—In reply to your letter, I will undertake to make the railway single road at £2000 a mile; *formed* for double road at £2400 a mile; if laid double, £2800 per mile. . . .—Your obedient servant,
GEORGE OVERTON."

This Mr Overton, it may be remarked, was well known as a railway engineer long before the time of Stephenson, and he was employed by the promoters of the first public railway to survey their original line in 1818, when the name of Stephenson had hardly emerged from the re-

* *Vide* Appendix II.

cesses of obscurity. Of his career, otherwise than so far as he was concerned with the first passenger line, we know little or nothing. But we have ample proof that he was in advance of his time. In a letter which he wrote to one of the newspapers while the agitation for the Stockton and Darlington Railway was in its infancy, he remarked, in reply to a correspondent who signed himself X. Y. Z. :—

“Whether the railway be thirty or fifty miles is immaterial as regards the advantages or disadvantages of that mode of conveyance. If the company make the main line, and leave the branches to individuals, whose interest it may be to make them, the cost will doubtless be less ; but should the company pursue a liberal policy, and by making branches to the different collieries, place the coal-owners upon an equal footing, the sum required must be increased in proportion to the extension of branches. . . . Railways are now generally adopted, and the cutting of canals nearly discontinued. In no part of the kingdom has there been so many canals and railways constructed of late years as in this part of South Wales. . . . Within the last fifteen years the great improvements which have been made in the construction of tramroads has led to the application of the principle on the following roads—the Cardiff tramroad, nine and three-quarter miles in length,—*this runs parallel with the Glamorgan Canal* ; the Aberdare tramroad, seven miles ; the Sirhowy tramroad, twenty-three miles ; the Brinove tramroad, twelve miles ; the Hay tramroad, twenty-four miles ; the Lainhangle tramroad, six miles ; the Abercorn tramroad, twelve miles. These tramroads and some hundreds of private roads lay in part within the before-mentioned distance from the place where I now write (Lanthelly, near Brecon). I have been a trader for the last fifteen years upon the Neath, Glamorgan, and Brecon Canals, and the different tramroads leading on to them. The Brecon Canal, though thirty-two miles in length, has only six locks upon it. About five years ago (in 1813) I constructed a tramroad which leads into it, and upon which is conveyed not more than one-third of what passes upon the canal. The road was completed in one year, since which time I have guaranteed the proprietors seven per cent. The canal was ten years in completing (*sic*), and has never averaged one per cent. per annum ! . . . I now send coal over thirty-six miles of public tramroad, and seven miles upon a canal.”

It was resolved to call in another engineer to report upon the proposed line. The gentleman selected was Mr Robert Stevenson, of Edinburgh, the eminent lighthouse engineer. On the 19th December 1818, the committee authorised him to make a survey, and on the 22d of the same month Mr Stevenson wrote to Mr Leonard Raisbeck and Mr F. Mewburn, solicitors to the company, undertaking the work offered for his acceptance. Of Mr Stevenson's survey we have not been able to ascertain anything further than that it was not in all respects satisfactory to the committee. He was, however, more or less consulted by them up to July 1821, when he furnished an elaborate opinion "relative to the management of the affairs of the subscribers for the railway from Stockton by Darlington to the coal-field of Durhamshire." In this document, now at the writer's elbow, he recommends the appointment of a committee of management to carry into operation the conditions of the Act of Parliament ; that this committee should meet once a month ; that a chief engineer should be appointed, in addition to a resident engineer ; that a banker should be elected cashier ; and that the resident engineer should be supplied with one or two assistants.

Aided most zealously by Mr George Overton, the committee prosecuted their labours with much vigour. A voluminous correspondence was opened up with the land-owners along the line of the proposed line. Some of these were strongly opposed to the project, and openly expressed their determination to have it upset. One of the most pertinacious opponents of the scheme was Lord Darlington, whom the committee endeavoured to conciliate by the offer of certain exceptional concessions. But his Lordship was implacable. On the 12th February 1819, he wrote

from Raby Castle,—“ Having long since been favoured with a similar permission to that which you now offer, I think it necessary only to add, that the measure you allude to appears to me now, as it has done before, to be harsh and oppressive, and injurious to the interests of the country through which it is intended that the railway shall pass ! ”

The strength of the opposition offered to the first bill applied for by the promoters of the Stockton and Darlington Railway was so formidable that it became necessary to use every means to conciliate or conquer it. Hence each member of the committee, and others who took an interest in the new undertaking, brought whatever pressure they could control to bear upon men having authority and power. Among the many letters which were received promising support and sympathy to the new venture, one, addressed to Mr Joseph Pease, jun., is more than usually interesting. It is from Mr T. Grey, of Millfield Hill, who seems to have had considerable Parliamentary influence, and who writes, under date of 22d February 1819,—“ I hardly know whether to think you in joke or earnest when you speak of my *numerous Parliamentary friends*. However, such as my influence is, I am most happy to exert it in favour of an object of public utility, and more especially in compliance with the wishes of friends whom I so much respect, and to whom I am under so many obligations. I did not apply exactly to the people you mentioned—not to Lord Tankerville, because he is almost superannuated, and never goes to the House ; nor to Opulston, because he is not in Parliament this session. But I wrote to Sir Charles Monck, Mr J. C. Curren, and the two St Pauls. I wrote also to Lord Grey and Mr Bennett ; but whether they have been so much

occupied with the affairs of the nursery (for they each got a young son a few days ago), or with the affairs of state which they conceive to be of greater importance, or whether they decline answering till they have made farther inquiries on the subject, I cannot decide."

About this time, also, Mr Francis Mewburn, the solicitor of the company, wrote from London to Mr Edward Pease,—"I had an interview with the Lord Chancellor last night. He is too sly an old fox to give his consent to either one line or the other. He said he should not give his support to either line, till he was perfectly acquainted with the merits of each, and he stated a variety of objections, which he admitted I had satisfactorily obviated. His Lordship approved very much of an equalisation of the rates, and also giving proprietors of estates through which the road runs power to communicate with the line. There was a clause to that effect in the bill."

CHAPTER V.

PROGRESS OF THE ARRANGEMENTS.

SO well had the promoters of the railway played their cards, that when their bill came on for the second reading, it all but passed. The committee record, in a report presented to the proprietors on the 7th May 1819, that 106 voted against the bill, and 93 in its favour, so that it was only rejected by a majority of thirteen. It is added in the same report, that the loss of the bill was mainly to be ascribed to the very short space of time allowed for completing the surveys, and for making friendly arrangements with the landowners and others; and to the extremely imperfect delineation of the plans, arising from the same cause. "But," it proceeds, "the opinion of your committee on the merits and general utility of the measure remains unshaken; and should the subscribers determine to bring it before Parliament in the next session, the money which has been expended will not, they conceive, have been misspent, as they trust the experience which has been gained will prove of equal value with the cost. The great and increasing demand for the surplus produce of this district towards Lancashire renders it desirable that a cheaper mode of carriage than by the present turnpike roads should be adopted; and it is very probable that at no distant period this railroad (if constructed) will be extended into the North Riding of Yorkshire, whereby great

facility would be afforded to the conveyance of the produce of the soil—coal, lime, lead, and merchandise.”

The first route chosen, on Overton's recommendation and survey, was from Stockton, *viâ* Darlington, Summerhouse, Ingleton, and Hilton, to the West Auckland coal-field. This line appears to have passed through one of the Duke of Cleveland's fox-covers, and in those days—happily not so in these—the scions of nobility regarded private fox-covers as of greater consequence than public railways! After the original bill had been defeated, the promoters determined to have another survey made, with a view to the adoption of another route, and the committee wisely resolved “that no time should be lost in endeavouring to conciliate all those whose interests or opinions are opposed to the measure.”

Again the committee entered into communication with George Overton, and requested that gentleman to make another survey. Mr Overton, however, appears to have felt somewhat irritated, if not exasperated, at the failure of his original scheme, and this feeling is rather apparent in a letter to Mr Mewburn, dated the 19th November 1819, in which he declares :—

“I am at a loss to know how to draw up any report, having before recommended another line. It will require some reasons to be shown for adopting the now proposed line of railway. In fact, so much has been already said and published on the subject, that a report seems unnecessary, except to show in what instances the present line is preferable to the former, and to account for the alterations in the plan. . . . You merely say you expect great opposition. If you had stated by whom, on what grounds you are opposed, and the points you most wished to establish, I should be better able to send you what you want. A full detail of what is generally introduced into reports of the kind would be little more than a repetition of what has so often been laid before the public.

That the line is shorter is evident ; that it is better is a matter of opinion."

After some negotiation, Mr Overton was at last induced to undertake another survey, which he brought to an end about the 1st of September 1820. On the 29th of the same month he submitted to the directors the following observations :—

"The branch from the top of the descending incline plane is by the present survey extended from its termination last year near the bottom of Cockfield Fell to Hagger Leases Lane, near the junction of several roads, which will furnish an opportunity of sending the lead and other produce of the adjacent country down to the port of Stockton.

"The branch to Coundon Grange is also extended to a field near Coundon turnpike-gate, which will afford means to Mr Wharton of sending his coal to market over the railway, as well as to deliver goods nearer to Bishop Auckland than the line of last year.

"The main line is also extended over the whole of the wharfs at Stockton, to give an equal opportunity to all the wharfingers of sending goods back over the road, or of receiving lead, corn, &c., brought down the said road.

"No other material alteration has been made from the survey of last year.

"A branch across the Tees, near Croft, may be extended into Yorkshire, which would prove very beneficial to that part of the country, the surface of which will admit of its being directed to accommodate Northallerton, and it may be extended to Thirsk, and on to the Sutton lime-rocks ; from which place a turnpike road through the hollow of the hill (between the point of Hambleton Hill called the White Mare and Crannico Hill) towards Helmsley, for the accommodation of that neighbourhood ; or it may probably be found preferable to direct the line from Thirsk, on the west of Crannico, by the intermediate villages, on towards Helmsley.

"The line can be extended in a direction to accommodate Richmond, Bedale, and Boroughbridge, intersecting good lime and stone quarries in the neighbourhood of Middleton Tyas,—in fact, collateral branches can readily be made to communicate with either or all of those places.

“A branch also from Etherley up the Wear opposite Wolsingham to Stanhope would be of the greatest importance to the country, in supplying it with timber, merchandise, &c., as well as securing the carriage of lead and the produce of the country downwards. Between Stanhope and Wolsingham there is the best lime-rocks I have seen in the country, which would undoubtedly be brought down over the railway for agricultural and other purposes, even as far as the town of Stockton.*

. . . “Having had a further and better opportunity of viewing the adjacent country in every direction, the great utility of the undertaking appears to me still more manifest.”

Following Mr Overton's report we have a manifesto from the committee dated November 1820, which partly recapitulates the observations of Mr Overton on the alterations of route resolved upon, refers to the appointment of Mr David Davis as assistant to Mr Overton, and proceeds as follows :—

“The whole of the line recommended by these gentlemen, and approved of by your committee, presents an inclination the best adapted to the intended purpose; except where it crosses the deep valley through which the Gaunless runs, there will necessarily be an inclined plane. On undoubted authority your committee can state that one horse of moderate powers could easily draw downwards on the railway about ten tons, and upwards of four tons of loading, exclusive of empty wagons. The expense of constructing a railway road on the intended line is estimated at £82,000, the greater part of which is already subscribed. Whilst your committee studiously avoid giving any colouring to the projected undertaking which they conceive it will not justly bear, they consider it a duty to express their increased conviction that it is fraught with advantages to the southern and western parts of the county of Durham, and the contiguous parts of the county of York. Your committee may also add, that no care has been wanting on their part to conciliate those who have hitherto opposed their efforts, and cautiously to avoid those injuries to private property which might be likely to arise in carrying into execution a work so extensive, and so replete with public good. Between the prin-

* Nearly a million tons of this limestone are now annually used for the purposes of the Cleveland iron trade, which did not then exist.

cipal places, the distances by the railway and by the turnpike roads are not materially different ; and when it is considered that one horse can draw on the proposed line as much as ten on the common road, it will readily appear that this saving of labour must be attended with a vast reduction in the price of carriage. To so populous and fertile a district, the benefits likely to result from the railway are incalculable. Coal, lime, and manure will be procured at a lower rate, and an easier mode of access to the markets obtained, which to the farmer are advantages of the highest value, whilst the commercial, mining, and manufacturing interest will experience the important benefit of a reduced rate of carriage for their respective products, and finally the population at large will amply partake of its beneficent results in the reduced price of fuel alone—a circumstance in the opinion of your committee sufficient in itself to recommend the project to the warmest support of the public. This saving will doubtless vary at different places on the line ; in the vicinity of the collieries it will be the least, increasing nearly in a progressive ratio with the distance ; as a medium, a reduction of about one-third may be fairly counted upon. Your committee, therefore, think it unnecessary to add a word more in commendation of the railway on the ground of public advantage. With regard to the revenue to be expected, your committee have no hesitation in stating that there is reasonable prospect of the subscribers receiving 15 per cent. per annum, and without anticipating any increased consumption, which is the invariable consequence of a reduced price of conveyance. The data on which this is founded have already been presented to you, and all the subsequent information the committee have received tends only to confirm and establish their accuracy. In a great undertaking like the present, it was only natural to expect opposition at the outset ; but your committee have remarked, with extreme satisfaction, the favourable change of public opinion. In asking leave to cross private property, very few dissenting voices have been heard, and whilst it has been stamped with the approbation of scientific and intelligent men in various parts of the kingdom, its friends in Parliament, your committee has reason to believe, have materially increased.”

Another Act was applied for in 1820, but its passage was delayed owing to the illness and death of the King. On the 12th of February 1820, a meeting of the committee was held at Yarm, under the presidency of Mr Thomas Meynell,

when a letter was read from the Parliamentary agents of the company, pointing out that there was no chance of the bill being passed previous to a dissolution ; "and as the new Parliament will probably meet in June, and sit a very short time, the chances are that there would not be time to pass the bill. Under all the circumstances, therefore, it is our opinion that you had better defer proceeding until the session of 1820-21." Upon this advice the committee resolved to act, adding that they begged "distinctly to assure the subscribers and the public that it is their unanimous intention to apply to Parliament in the session of 1820-21, for an Act to authorise the execution of the project."

For their second, as for their first bill, the Stockton and Darlington Railway Company had to make a great fight. Every member of Parliament that could be influenced, directly or indirectly, was pressed into the service of the promoters. Every peer that was known to have any doubt or hesitation was seized upon and interviewed until he became a convert, while those who looked upon the measure with favour were confirmed in the faith. Nay, more, the promoters and their friends even carried their influence as far as the hustings, and spared neither trouble nor expense in endeavouring to secure—especially in the North of England—the return of candidates known to be partial to their cause. In testimony of this fact, we find Mr Overton writing on the 6th May 1820 : "I presume Mr Lambton has discovered that what he has done for the Darlington tramroad has been in some degree repaid by the exertions of the advocates of that measure at his election." Their efforts were triumphant. The second bill met a different fate to the first, and in April 1821 it received the Royal Assent.

It is, perhaps, scarcely necessary to add—it cannot be

necessary to remind North of England readers—that the chief promoter—the very “head and front”—of the movement which culminated in the passing of the Act authorising the construction of the Stockton and Darlington Railway, was Edward Pease. Very soon after the Act had received Parliamentary approval, that gentleman and George Stephenson were brought together under circumstances so singular as to merit here a passing record. There is a tradition that Stephenson tramped from Newcastle to Darlington with a bundle on his back for the purpose of seeing Mr Pease and offering his services for the construction of the new line. This story, however, is so far from the truth that it may safely be relegated to the realms of fiction. It may, indeed, be assumed that Stephenson's was the first name that would occur to Mr Pease in casting about for an engineer. At that very time Stephenson was laying the Hetton Colliery Railway—a line about eight miles in length, which traversed a very undulating and difficult country. His name had come prominently under Mr Pease's notice on account of the many improvements and modifications of permanent way and rolling stock which he had patented. Application had, moreover, been made to Mr Stephenson to survey a line from the collieries in the Auckland district to Darlington and Stockton some time before, so that the two men must have been all but intimately acquainted with each other.

We are indebted to the late Mr Nicholas Wood for an interesting account of Stephenson's first visit to Mr Pease. The narrator, in his admirable address on the two late eminent engineers, the Messrs Stephenson, father and son, says that the event “is deeply impressed on my memory, by having accompanied Mr Stephenson from Killingworth

to Darlington and back to Durham; and by having afforded him a practical joke against me, which, to within a few weeks of his death, and on the occasion of the last time I saw him, he reminded me of. The incident is given by Smiles, not quite correctly. The fact is, we rode on horse-back from Killingworth to Newcastle, a distance of five miles, travelled from thence by coach, thirty-two miles, to Stockton, then walked along the proposed line of railway, twelve miles, from Stockton to Darlington. We had then the interview with Mr Pease, by appointment, and afterwards walked eighteen long miles to Durham, within three miles of which I broke down (which constituted the joke against me), but was obliged to proceed, the beds being all engaged at the 'Travellers' Rest.' This interview with Mr Pease, which was on the 19th April 1821, had the effect of Stephenson being ultimately appointed engineer to the Stockton and Darlington Railway."

Very shortly after Mr Stephenson's visit to Darlington, the directors of the new line considered the question of his appointment as their engineer. The result of their deliberations is embodied in the following letter:—

"DARLINGTON, 7th mo. 28th, 1821.

"ESTEEMED FRIEND, GEORGE STEPHENSON,—Annexed are some resolutions passed at our last general meeting. We beg thee to take them into consideration, and so soon as thou can'st name thy charge for effecting all they contain which attaches to thee as engineer, drop me a line. The resolutions are so definite and comprehensive, it does not seem needful to add more, than to request that as soon as the crops are off the ground, no time may be lost, provided nothing can be done in the meantime. In making thy survey, it must be borne in mind that this is for a great public way, and to remain as long as any coal in the district remains. Its construction must be solid, and as little machinery introduced as possible—in fact, we wish thee to proceed in all thy levels, estimates, and calculations, with that

care and economy which would influence thee if the work was thy own; and it would be well to let comparative estimates be formed, as to the expense of a double and single railway, and whether it be needful to have it only double in some parts, and what parts; also comparative estimates as to the expense of malleable or cast iron. We shall be glad to hear from thee soon, and I am, on behalf of the committee, thy assured friend

(Signed) "EDWARD PEASE."

To this characteristic and business-like letter Mr Stephenson returned the following reply:—

"EDWARD PEASE, ESQ.

"SIR,—After carefully examining your favour, I find it impossible to form an accurate idea of what such a survey would cost, as not only the old line must be gone over, but all the other deviating parts, which will be equal to a double survey, and, indeed, it must be done in a very different manner from your former one, so as to enable me to make a correct measurement of all the *cuts and batteries* on the whole line. It would, I think, occupy me at least five weeks. My charge shall include all necessary assistance for the accomplishment of the survey, estimates of the expense of cuts and batteries on the different projected lines, together with all remarks, reports, &c., of the same. Also the comparative cost of malleable iron and cast-iron rails, winning and preparing the blocks of stone, and all materials wanted to complete the line. I could not do this for less than £140, allowing me to be moderately paid. I assure you, in completing the undertaking, I will act with that economy which would influence me if the whole of the work was my own.

"GEORGE STEPHENSON.

"KILLINGWORTH COLLIERY, *August 2d, 1821.*"

The resolutions referred to in the letter of Mr Pease are as follows:—

"1. That on the best information this meeting has been able to collect, a railway be adopted as preferable to a tramway, and that land sufficient for a double railway be purchased as soon as the precise line is definitely settled.

"2. That the sub-committee write to George Stephenson to ascertain his charge for furnishing the information required by the third resolution.

"3. That in order to settle the line, George Stephenson be in the first instance employed to survey the one laid out by George Overton, with instructions as follows :—

"*First*, to determine whether, in his opinion, that line be practicable throughout.

"*Second*, whether any useful deviation can be made from it, without exceeding the limits of a hundred yards on either side.

"*Third*, whether, in case he consider the line not to be practicable, or some deviation from it beyond the limit be very desirable, then to specify through whose grounds such deviation leads, noticing the owner, occupier, township, and parish in which the same is situated.

"*Fourth*, that in case the line be in his opinion practicable, but nevertheless a deviation from it beyond such limits appears to him in part very desirable, then to estimate the comparative expense so far as such deviation extends, that it may be seen by the committee whether there is a difference which will defray the expense of the new Act of Parliament.

"*Fifth*, also to ascertain whether the tunnel and deep cutting contemplated in Lord Barrington's grounds can be avoided, and then through whose land such deviation leads."

Satisfactory terms were arranged between Stephenson and the directors, and the former at once made arrangements for undertaking the proposed survey.

CHAPTER VI.

THE FIRST RAILWAY ACTS.

THE first Act passed by Parliament for the construction of a public railway (2 George IV.) received the Royal Assent on the 19th April 1821. It provided "for making and maintaining a railway or tramroad from the river Tees at Stockton to Witton Park Colliery, with several branches therefrom, all in the county of Durham." Of these collateral branches, one commenced in the township of Egglescliffe, and terminated at or near Yarm Bridge; another commenced at or near Lowson's Slack, and terminated at or near Northgate Bridge, in Darlington; another commenced at or near Brusselton, in the township of St Helen's, Auckland, and terminated at or near Coundon turnpike-gate; another commenced near Norlees House, West Auckland, and terminated at Evenwood Lane; and the last commenced at or near the river Tees, and ended at or near the south-west end of Stockton-on-Tees.

It was set forth in the preamble that these different lines "will be of great public utility, by facilitating the conveyance of coal, iron, lime, corn, and other commodities, from the interior of the county of Durham to the town of Darlington and the town and port of Stockton, and towards and into the North Riding of the said county of York; and also the conveyance of merchandise and other commo-

dities from the said town and port of Stockton to the said town of Darlington, and into the interior of the county of Durham, and will materially assist the agricultural interest, as well as the general traffic of that part of the country, and tend to the improvement of estates in the vicinity of the said railways or tramroads."

After reciting that the practicability of making the railway had been ascertained by levels and surveys, the Act proceeds to give the names of the first shareholders who formed the company. At this distance of time, it may be interesting to furnish to posterity a list of those that were bold enough to risk their means in a then somewhat discredited undertaking. They were—Benjamin Atkinson, Jonathan Backhouse the younger, Henry Belcher, John Baxter, Robert Barclay, Richard Blanchard, Henry Birkbeck, Andrew Brown, Robert Bald, Viscount Barrington, Robert Botcherby, John Backhouse, William Braithwaite, Jeremiah Cairns, Warcop Consett, William Cust, John Coates, Christopher Dove, William Dove, William Nicholas Darnell, John Davidson, Thomas Eeles, William Atkinson Fountaine, Benjamin Flounders, John R. Fenwick, William Gent, W. Gill, Joseph Gurney, Joseph John Gurney, Samuel Gurney, Barrett Hodgson, Thomas Jennett, Richard Jackson, John I'Anson, William I'Anson, J. Kitching, Robert Kirby, William Leatham, G. Lockwood, Thomas Meynell, G. Meynell, Richard Miles, Thomas Miles, John Mewburn, George Middleton, Simon Martin, Henry Newman & Brothers, Joseph Pease the younger, Thomas Benson Pease, Edward Pease, John Pease, Daniel Mitford Peacock, Harriet Peacock, Richard Pickersgill, Matthew Plummer, William Richmond, Leonard Raisbeck, Thomas Richardson, T. P. Robinson, Thomas Rogers, Richard Scott,

Matthew Scotson, Henry Stapylton, Francis Storey, Ellen Storey, William Skinner, William Skinner the younger, William Sleigh, John Trotter, Thomas Taylor, Thomas Allison Tennant, William Tate, George William Todd, Anthony Thistlethwaite, John Wardell the younger, Cuthbert Wigham, Matthew Wadeson, John Wilkinson, and Charles Benjamin Walker.

It is a fact not without significance that in their first Act the Stockton and Darlington Railway Company took no powers for the use of locomotives. The Act is exceedingly voluminous, extending to sixty-seven pages of closely printed matter, and is probably the longest as well as the earliest Railway Act that received the sanction of Parliament ; but we cannot find that within its four corners there is any mention whatever of the employment of engines, whether locomotive or stationary. It is only provided, with convenient vagueness, that the Company shall "appoint their roads and ways convenient for the hauling or drawing of wagons and other carriages passing upon the said railways or tramroads, with men or horses, or *otherwise*." But the omission is specifically supplied in the Company's second Act—passed on the 23d day of May 1823—wherein they are empowered to "make, erect, and set up one permanent or fixed steam-engine, or other proper machine, in such convenient situation" as they might select. In the following section, power is acquired for making and using "locomotives or movable engines, for the purpose of facilitating the transport, conveyance, and carriage of goods, merchandise, and other articles and things, upon and along the same roads, and for the conveyance of passengers upon and along the same roads."

The latter Act was obtained "to enable the Stockton and

Darlington Railway Company to vary and alter the line of their railway, and also the line or lines of some of the branches therefrom, and for altering and enlarging the powers of the Act passed for making and maintaining the said railway." It was in this bill that powers were sought for the construction of the Croft branch, hereafter referred to. The deviations contemplated in the main line were chiefly in the immediate neighbourhood of Stockton or Darlington. The expense of making the Croft branch, and carrying out all the alterations and additions authorised to be made by the second Act, was calculated at £74,300.

One cannot look into these initial Railway Acts without coming to the conclusion that their preparation must have entailed on the solicitors of the company an extraordinary amount of labour. They contain several features and provisions that are not to be found in subsequent Acts, although it is obvious that they must have formed a basis for the operations of all future railway promoters. The first Act bears the imprint of Dyson & Jones, House of Commons. There is nothing about it to show that any local solicitor had aught to do with its framing; but the second Act, which only extends to twenty-one pages, or less than a third of the matter contained in the first, bears the names of Mr Leonard Raisbeck, Stockton, and Mr Francis Mewburn, Darlington.

CHAPTER VII.

STEPHENSON'S MODE OF PROCEDURE.

IN the autumn of 1821, George Stephenson commenced the survey of the new line, aided by John Dixon, the grandson of that George Dixon of Cockfield who took an active part in surveying and promoting the canal scheme of 1767. Robert Stephenson, "a slight, spare, bronzed boy,"* was withdrawn from his occupation of a pit-viewer, and brought out with the surveying party to undertake labour of a more healthy kind. This was the younger Stephenson's first initiation into the laying-out and construction of railways; and although he had the opportunity, while serving his apprenticeship at Killingworth, of seeing improvements made in the different colliery railways under the inspection of his father, as well as of visiting occasionally the Hetton Railway, then under construction, yet it is difficult to suppose that at this early period his own knowledge enabled him to render more assistance to his father and to Mr Dixon than any other very intelligent but inexperienced lad.†

Stephenson carried out the survey with so much credit to himself and satisfaction to the committee, that on the 22d of January 1822 he was appointed engineer to the company, "at a salary of £660 per annum, the said salary being under-

* *Vide* Jeafferson's Life of Robert Stephenson.

† Practical Mechanics' Journal for 1866.

stood to cover all the services and expenses of himself and assistant surveyors." Jeafferson has mentioned that when the survey was completed, Robert Stephenson's name was placed on the plans as the engineer, and he has found in this alleged fact "an affecting instance of paternal devotion." But although Robert's name may have appeared on some of the plans—a circumstance, in itself, of the most trifling importance—we have abundant evidence to show that his father, and his father alone, was held responsible to the company; and the limited part that Robert took in the construction of the line is evidenced, moreover, by his departure for South America before it was completed.

The first rail was laid by Mr Thomas Meynell, of Yarm, as chairman of the company, near to St John's Well, Stockton, on the 23d May 1822. The ceremony was one of considerable rejoicing, but the proceedings do not call for more than this passing allusion.*

The following hitherto unpublished letter of George Stephenson, addressed to the committee, is not without interest as showing the progress of the works:—

"KILLINGWORTH COLLIERY,
21st May 1822.

"GENTLEMEN,—Thinking you would be wishful to know how we are proceeding with the work on the line of railway, I beg to inform you that we are getting on as well as I expected, but that the dryness of the season, and the strong nature of the clay in the cuttings, have greatly damped the spirits of the undertakers; in consequence of

* An anecdote of this occasion is preserved. After the ceremony a boy was heard shouting in the streets of Stockton, "Speech of Mr Thomas Meynell, &c., one penny," at the same time exhibiting a number of sheets in his hand, which purported to contain the speech. One gentleman among others invested in a pennyworth, and found that it was simply a blank sheet of paper. "Why, you little rascal," he said, "there's no speech here." "No, sir," replied the quick-witted youth, "because he said nought."

which, I thought it prudent to advance the price one penny per yard more than their bargains, which is still below my estimate.

"I hope that they will now go on cheerfully. The price will be lower as we approach Darlington, as the ground appears to be softer. There is now about two miles ready for laying down the road—indeed, I think the labourers already employed are getting on faster than Mr Steel and Mr Dixon can have the ground ready for them. There must be no time lost in buying the ground after it is measured. On account of the line passing so awkwardly through Mr Davidson's ground, I have deviated a little to the north, which I believe will quite meet Mr Smith's views. The line will run from thence almost direct to Goosepool, and although it may be attended with more cutting, yet, I think it is the better line. This line will pass through some new ground, but I believe the owners will not object to it, and I hope will permit us to commence this season.

"The ship with 9200 oak blocks has arrived from Portsea, most of which are very good. The rest must be rejected. It will not be prudent to have more oak blocks than will reach Darlington, as stone will then be cheaper.

"I have an offer of malleable iron gates from the Bedlington Iron Company so low that I think they may be sold at any time to the blacksmiths in your country for as much as they now cost. . . . They will weigh one and a half cwt. at 11s. 8d. per cwt. or 17s. 6d. each gate. They are the cheapest gates I have seen.

"GEORGE STEPHENSON."

With the limited and imperfect engineering knowledge of the time, it was no easy task to undertake the construction of the first passenger railway. The stretch of country which the line traversed was remarkably uneven, and the coals had to be conveyed from the collieries in the Auckland Valley over a high ridge of country called Brusselton Hill.

Stephenson was equal to the occasion. He had previously instituted, along with Mr Nicholas Wood, an extensive series of experiments on the diverse descriptions of motive power then in use on the different colliery railways. On these experiments he founded his system of motive

power to be used on railways generally—first, in applying such of the various descriptions of motive power thus elucidated as were applicable to the existing lines of railway; and next, in applying them generally in laying out new lines. The conclusions based on these experiments have thus been stated by Mr Wood :—

“ 1st, On the level, or nearly level, gradients, horses or locomotive engines were proposed to be used, it being laid down as a rule that, if practicable, the gradients, ascending with the load, should not be more than 1 in 100.

“ 2^d, In gradients descending with the load, when more than 1 in 30, the use of self-acting planes; and

“ 3^d, In ascending gradients with the load, where the gradients did not admit of the use of horses or locomotive engines, fixed engines and ropes should be adopted.”

Acting on these principles, Stephenson employed three fixed engines, five self-acting planes, and three and a half miles of locomotive on the Hetton Colliery Railway, which was opened in 1822. Similarly, he employed a fixed engine on the Stockton and Darlington Railway to pull the coals over Brusselton Hill, and recommended the employment of locomotive engines on the descent from thence to Darlington and Stockton. In this plan, however, he encountered some opposition. Mr Benjamin Thompson, of Eighton Banks, advocated the employment of fixed engines, for which he had obtained a patent. Mr Pease, in a difficulty, decided to settle it for himself, and to that end he accepted Stephenson's invitation, and inspected the Killingworth engine, along with some of his co-directors. The result was a resolution to adopt locomotives of the same description as the Killingworth engine, although somewhat more powerful.

On the 29th December 1821, after consulting a number

of eminent engineers, the committee unanimously concluded "that two-thirds of the railway should be laid with malleable iron, and the remainder with cast iron, the chairs in both cases to be of cast iron."

Malleable iron rails, 28 lbs. per yard, "fish-bellied," and Birkinshaw's patent, were recommended by Stephenson for the Stockton and Darlington Railway. On this account he is said to have had a rupture with Mr Losh of the Walker Iron Works, whose patent cast-iron rails he declined, notwithstanding their old-established intimacy, to adopt. To this circumstance has also been attributed the origin of the engine-building shops in Newcastle, which have so long held a distinguished place in the annals of locomotive engineering. Both reports are doubtful, if not improbable. Stephenson was, to begin with, the co-patentee with Mr Losh of the rails he is said to have rejected, and his adoption of malleable iron, in defiance of his own pecuniary interest, could scarcely fail to persuade Mr Losh that what he had done had been done for the best, and in the firm conviction that the day for cast-iron rails had disappeared. As for the factory at Newcastle, it was jointly promoted by Mr Pease, Mr Richardson, and Mr Stephenson, and its erection, or the building of a similar establishment elsewhere, had become a real necessity of the times.

Of the Mr Richardson here mentioned, whose name has found its way into this narrative for the first, and probably also for the last time, it is due, *par parenthesis*, that something should be said. He was a cousin of Edward Pease, a native of Darlington, and had realised a handsome fortune as a bill-broker in London. At an early stage in the career of the Stockton and Darlington Railway, he became one of its most attached friends, and it was largely due to his influ-

ence with bankers and others of affluent means that the company were so easily enabled to raise the necessary capital for the completion of their scheme. Like Mr Pease, also, he had much confidence in Stephenson, and unhesitatingly aided his cousin in providing the means for the erection of the Forth Street Engine Works in Newcastle.

The specifications and conditions under which the first rails required for the first public railway were supplied cannot fail to be of interest. They are, therefore, subjoined:—

“ 1. The proposals to specify the lowest price, as there will not be an opportunity of making any abatement.

“ 2. No tender will be considered unless made by the principal or accredited agent, nor should it differ in any respect from these conditions and specifications.

“ 3. The party contracting for malleable or cast-iron rails should give a bond in the penalty of £4000 for the fulfilment of his contract according to specifications.

“ 4. The party contracting for chairs to give a bond in a penalty of £500 for the fulfilment of his contract according to specifications.

“ 5. The rails of malleable iron to be made from scraps or good English bars re-manufactured—the Railway Company to have the liberty of sending an occasional inspector to see that the rails and chairs are made of materials according to agreement.

“ 6. The rails, whether malleable or cast iron, and the chairs for the same, to be tested as laid down by a weight of fourteen tons, placed on a four-wheeled carriage, coupled at a distance of four feet, and moving at the rate of two and a half miles per hour.

“ 7. All rails, of either description, and all chairs, which shall be broken on testing by the above weight, or which at any time within three years after being laid down, shall have any apparent deficiency, shall be returned to the contractor, who shall bear the expenses of all carriage, and supply others to the Railway Company free from any charge. . . .

“ 8. The engineer employed by the Railway Company shall, at

their expense, lay down one hundred yards of malleable iron rails, and one hundred yards of cast-iron rails, to prove that the specific weight of the rails is sufficient to bear the above-described weight," . . .

The specifications for the malleable iron rails prescribed that they should be fifty-six pounds per double yard ; that the breadth of the top of the rail should be two and one-fourth inches, and the depth at the end two inches ; that the depth at the middle should be three and one-fourth inches ; that the depth at the top flange should be three-quarters of an inch ; that the thickness of the web at the top should be three-quarters of an inch ; that the thickness of the web at the bottom should be half an inch ; that the edge should be rounded and the surface flat ; that the rails should be perfectly straight, and fit to the chairs accurately ; and that a sample rail and chair, or patterns thereof, should be furnished to the company.

For cast-iron chairs the specifications provided that they should be twelve pounds per double yard, each chair to weigh six pounds ; and that the malleable iron rails and chairs for the same should be delivered on shipboard in the following proportions, namely : " One hundred tons of rails to be ready to be put on board on or before the 1st March 1822 ; one hundred tons to be ready to be put on shipboard every two months afterwards, until eight hundred tons shall be ready to be put on board, the Railway Company reserving to themselves the right to increase that number to twelve hundred tons, . . . such increased number of tons to be supplied to the Railway Company on the same terms as the eight hundred tons."

The weight and dimensions prescribed for the cast-iron rails and accessory chairs were as follow :—" The length of each rail to be 4 feet, cast from good pig-iron ; the

weight per double yard to be 115 lbs.; the weight of the chairs to be 10 lbs. each, or 15 lbs. per double yard; the breadth at the top of the rail to be $2\frac{1}{4}$ inches; the depth at the end to be 4 inches; the depth at the middle to be 6 inches; the depth of the top flange to be 1 inch; the thickness of the web at the top to be five-eighths of an inch."

In the *modus operandi* of laying down the rails and fixing them together, the engineers had to feel their way to the best results. At the outset of the railway system, there was a considerable amount of discussion as to whether stone blocks or wooden sleepers were more suitable for the purposes of the permanent way. The directors of the Stockton and Darlington Railway made up their minds to try both. They laid down specifications for the supply of stone blocks, providing that each block should be 18 to 24 inches long by 14 to 18 inches broad, and 10 to 12 inches deep, "the top and bottom of each block to be parallel with each other." Into one of the parallel sides of the stone block, and exactly in the centre, the contractor was required to insert the cast-iron metal chair to the depth of half an inch. Two holes, each three-quarters of an inch in depth, were drilled through each block to correspond with those of the chair. It was required that 8000 of these blocks should be ready for use, and laid out in the quarry, ready for the loading of carts, by the 1st of March 1822, and that 8000 should be ready every two months afterwards until 64,000 blocks should be ready for use. The oak blocks were each 2 feet 6 inches in length, 6 inches in breadth, and 6 to 8 inches in depth; and of these a much larger number were required. The two kinds of block had various features of differ-

ence, but both were alike in this, that they were within a few years superseded by the more massive and durable "sleeper."

The first engine employed on the Stockton and Darlington Railway was appropriately called by the name of "Locomotion," its locomotive capacity being its greatest and most distinguishing novelty at the time of its construction. In passing, it may be mentioned that this primitive and patriarchal engine may now be seen, elevated on a pedestal built for its reception, in front of the Darlington North Road Railway Station, where it was placed with august ceremonial in June 1857. "The conveyance of passengers," says Mr Wood, "did not form a part of the original intentions of the promoters. The conveyance of coals at the cheapest possible rate was the desideratum, and the principle which Stephenson was instructed to proceed upon. High rate of speed was no element for the consideration of either directors or engineers. Heavy loads, conveyed at moderate rates of speed, were alone considered. Hence the locomotive engines to be used on the Stockton and Darlington Railway were constructed to travel from four to six miles an hour with the heaviest load which the power of the boiler in raising steam enabled them to accomplish; and hence also we find, on Messrs Walker and Rastrick's visit in 1829, two years after the opening of the line, they place the performance of the engines at $47\frac{3}{4}$ tons of goods, $23\frac{1}{8}$ tons weight of carriages, the engine and tender weighing 15 tons,—making altogether a gross weight of $86\frac{1}{2}$ tons, moved at five miles an hour."

"Locomotion" was constructed under Stephenson's direction at the Forth Street Engine Works in Newcastle.

The best and most that it could do was to go along at four to six miles an hour; and an engine and tender of fifteen tons could draw on a level nearly forty-eight tons gross load, at the rate of five miles per hour. The principal mechanical details of this parent engine will be afterwards described. They will always form an important chapter, interesting almost to romance, in the strange and eventful history of steam locomotion.

At the Brusselton hill-top, two thirty-horse power engines, combined with one axle, were erected by R. Stephenson & Company of Newcastle, for drawing the wagons up the incline. The cost of these engines was £3482, 15s. At the Etherley hill-top, other two engines were erected, each of fifteen-horse power, combined with one axle, at a cost of £1982, 15s. The contract for the construction of these engines provided that the builders "should find every description of material, and all fitting-up for both engines and boilers, except that the company shall find all the stones in the rough state that may be wanted for the said purpose at Brusselton or Etherley quarries, we leading the said stones—the two boilers for the first-named engine to be 8 feet diameter by 20 feet long, and the boiler for the Etherley engine to be of the same dimensions, and to be made of the best scrap-iron. . . . The size of the working cylinders to be thirty inches for the Brusselton engine, and twenty-two inches for the Etherley engine, and all other materials to be in proportion, and of the best quality and workmanship, fitted up in a complete and workman-like manner."

George Stephenson continued to bestow unremitting attention on the construction of the Stockton and Darlington line until the middle of 1824, when he was appointed

engineer to the Liverpool and Manchester line, then projected. On the 19th May 1824, Mr Edward Pease received from the chairman of the Manchester and Liverpool Railway Company an intimation of Stephenson's appointment, and requesting that, "if he be on your line, you will send a special messenger to inform him that a letter has been sent to him at Newcastle, notifying the same."

On the 19th November following, Stephenson addressed the following interesting letter to Joseph Pease:—

"DEAR SIR,—Yours of the 16th has been forwarded to me. The remarks that the Rotherham people have made of the liability of the cast iron breaking when cast round the wrought iron is very erroneous, for it is well understood at Newcastle-on-Tyne not to have that effect, if a certain allowance is made for the break of metal in forming those junctions. I am well aware that none of those people will give themselves the trouble to erect such a bridge, so long as they have more orders than they can execute, which is the case, I suppose, with every ironmaster in the kingdom. As the price of iron has advanced so much lately, and is still likely to advance higher on that account, I should advise a stone bridge to be erected,* if Mr Benomi† thinks there is no risk of its tumbling down. I think it would be much safer if the abutment walls were allowed to stand over the dead of winter before the arch is commenced with. If a severe winter should come upon the new oak, there might be danger of its settling more in one part than in another. You can have Benomi's opinion on those points. Did not Mr Longridge‡ send in an offer for the bridge? I am, dear sir, yours very truly,

(Signed) "GEORGE STEPHENSON.

"NEWCASTLE-UNDER-LYNE,
October 19, 1824.

"P.S.—We have sad work with Lord Derby, Lord Sefton, and Bradshaw, the great canal proprietor, whose grounds we go through with the projected railway. Their ground is blockaded on every side

* This refers to the bridge at Darlington. † An architect at Durham.

‡ Bedlington Ironworks.

to prevent us getting on with the survey. Bradshaw fires guns through his grounds in the course of the night, to prevent the surveyor coming on in the dark. We are to have a grand field-day next week. The Liverpool Railway people are determined to force a survey through if possible. Lord Sefton says he will have a hundred men against us. The company think those great men have no right to stop a survey ; it is the farmers only who have a right to complain, and by charging damages for trespass, it is all they can do.

“ G. S.”

CHAPTER VIII.

PROGRESS OF THE WORKS.

REPORTS were frequently made to the shareholders by the committee while the line was under construction. These reports would naturally be looked for with considerable eagerness. Some of the shareholders would have misgivings about the prudence of their investment, and would seek to appease their anxiety by reading the committee's reports in the most favourable light. And, in truth, it was difficult, unless by a very flagrant perversion of the meaning of words, to do otherwise than extract comfort from the statements and anticipations of the directors; for, in spite of frequent difficulties, their conduct appears to have been uniformly pervaded by a sanguine and assured sense of security in their project.

Under date of the 13th April 1824, we find the committee reporting that "the late season has upon the whole been favourable to the progress of the works, which in general have been carried forward by the contractors to the satisfaction of the sub-committee and of the engineers. The sub-committee, having considered the necessity of stimulating by every means in their power the rapid progress of the works in the forming of the way, have from time to time offered and paid premiums to the contractors for extra exertions, which in some cases has had a good effect. The whole of the main line of the Darlington branch

is now in progress, except through the estates of a few land-owners, with whom every attempt on the part of the committee to treat for the land required has proved unavailing, no resource being left but to have the valuation settled by a jury. Your solicitors have been requested to proceed accordingly, and your committee anticipate this dispute being soon terminated in a manner favourable to the interests of the company."

In the same report there occurs the following paragraph:—"Conformably to the agreement entered into between the company and the trustees of the late Lord Strathmore, a bill was introduced into the House of Commons for a branch railway to Evenwood Bridge; but the committee of the House of Commons, being influenced by the representatives of the coal-owners interested in the extension of the said line of branch railway, extended the line to Hagger Leases Lane. In this shape the sub-committee expect to hear in a few days of the bill having passed the House of Lords."*

The next report available respecting the progress of the works is from the general committee to the general body of shareholders, and is dated the 8th July 1823. It sets forth that "since the last annual meeting of proprietors, your committee have proceeded in the works of the railway, and have constructed six miles of road between Stockton and Goosepool, and also the branch to Yarm for three-quarters of a mile. From Goosepool to near Burdon, land has been purchased for four miles, and contracts made for forming embankments and excavations on terms advantageous to the company, and below the engineer's estimate. At the western extremity of the line your com-

* *Vide* Appendix III.

mittee have made considerable progress, and are using every exertion for the completion of the works, with as little delay as their nature will admit of. The entire quantity of land purchased by your committee extends to about seventeen miles, and they trust the whole of the land required for the main line will be purchased in the course of the summer. Your committee have received from the Bedlington Iron Company 900 tons of malleable iron rails, and 243 tons of cast-iron rails, chairs, and crossing-plates from the Neath Abbey Company. They have also received nearly 60,000 oak blocks from Portsmouth (spoken of by George Stephenson as *Portsea*); and from the trials already made of the malleable iron rails, your committee have great satisfaction in stating that they fully answer the expectations formed of them by the engineer, and confirm them in their opinion of their being preferable to cast-iron rails."

It is evident, from the frequent references that are made to the comparative merits of cast and malleable iron rails, that the subject was one that induced a good deal of anxiety and perplexity to the promoters of the first public railway. It was reserved for them to feel their way, cautiously and by frequent experiments, to conclusions which, in the present generation, appear to be as fixed as the laws of the Medes and Persians. The fencing of the line also occasioned frequent deliberations, for it soon became apparent that it was necessary, not only in the interests of the public, but also in that of the company itself, that in some way or another the line should be enclosed. On this debateable problem the general committee reported—also in July 1823—that "we have considered it advantageous to the company to adopt wall fences from Witton Park to

near Shildon, for the making of which, proposals have been advertised. The remainder of the fences on the line your committee propose to plant with quicks. From Stockton to near Fighting Cocks the road has all been fenced with quicks, which appear to be in a flourishing state."

Ways and means were necessarily the theme of many a consultation, both of the general committee and of the sub-committee. On the day above named they report that, "in order to meet the expense incurred in the purchase of land, and the extensive works they have in hand, your committee have called for five instalments of £10 per cent. each, and a sixth instalment of 20 per cent. is ordered to be paid on the 1st day of August next. Your committee submit to the proprietors a statement of the treasurer's receipts and disbursements, by which a balance of £9342 appears due to the treasurer, but which will be liquidated by the instalment now called for, and which, with the remaining 30 per cent., there is every reason to hope will be adequate to complete the works." After the unwelcome announcement of another call, the committee could hardly do less than add, "that no circumstances have arisen to induce them to alter their opinion of the great public benefit to be derived by all classes of the community from this undertaking, and that a fair and reasonable return will be made to the proprietors for the capital invested."

The adoption of locomotive power does not seem to have been seriously considered by the promoters of the Stockton and Darlington Railway until the permanent way was far advanced towards completion. In the spring of 1824, the directors had occasional discussions on the relative merits of locomotives and horse power, and on the 24th July of that year they resolved, "that R. Stephenson & Co. be applied

to for the terms on which they will make two locomotive engines, and that our engineer (George Stephenson) furnish specifications of the same." We have not been able to lay our hands on Mr Stephenson's specifications, and doubt whether they are now extant. The sequel shows, however, that they must have met with approval, for on the 16th September 1824, an order was given to Messrs R. Stephenson & Co. to construct two locomotive engines for the sum of £500 each. Such were the circumstances under which "Locomotion" and its companion, "Hope," were ushered into the world.

One of the first necessities of the line was a supply of wagons adequate to meeting the coal-traffic that was expected to pass over it. An order was given to Thomas Storey, on the 25th January 1825, for the supply of a number of wagons, "the company to find timber for the same, and the contractor for the ironwork shall be furnished with iron by the company."

From a mechanical point of view, it may now be found amusing to peruse the conditions laid down for the construction of the first wagons used on the line. It was provided that the soles, if of English oak, should be 7 inches by 5 inches; that the bottom sheaths, if of English oak, should be four in number, two of them measuring 9 inches by 4 inches, and the other two 6 inches by 4 inches—an inch more in each sheath being required if made of other timber; that the height from the top of the rail to the under side of the cleat, or lining affixed to the bottom side of the sole ends, should not exceed 1 foot 7 inches; that the height from the top of the rail to the bottom should not exceed 1 foot 8 inches; that the coupling chains should be made of 1-inch round iron, and that protecting or side

chains be fixed to the wagons ; that the end link should be $3\frac{1}{2}$ inches long, and the rest of the links $2\frac{1}{2}$ inches long ; that the bottom part should be $3\frac{1}{2}$ inches broad and $1\frac{1}{8}$ inches thick to the first bolt-hole in the sheath ; that the pin-hole should be $1\frac{1}{4}$ inches diameter, and $1\frac{1}{2}$ inches long from the end of the bar ; that the coupling chain-pin should be $5\frac{3}{4}$ inches long from the shoulder, $1\frac{1}{8}$ inches thick at the shoulder, and $1\frac{1}{4}$ inches thick at the point ; that the drawing strap and crook should be made of 1-inch round iron ; that the journals and axles should be not less than 3 inches diameter ; that the wheels should not be less diameter than 2 feet 6 inches, nor to exceed 2 feet 10 inches, exclusive of the flange ; that the weight of the wheels when finished should be not less than $2\frac{1}{4}$ cwt., nor to exceed $2\frac{3}{4}$ cwt. ; that the break handles be of $1\frac{1}{2}$ inches round iron ; that the bottom bands be $1\frac{3}{8}$ inches square ; and that the whole of the ironwork specified should be made of best scrap bars. A penalty was attached to bringing any wagon on the line not constructed in accordance with these requirements.

The works had made such progress towards completion that, on the 9th September 1825, the general committee presented the shareholders with the following report :—

“ Although unexpected and unavoidable delays have attended the labours of your committee, they have at length the pleasure to congratulate you on the completion of the main line of your railway, and of the Darlington and Yarm branches. Your committee have steadily proceeded in the execution of the works committed to their charge through great and unforeseen difficulties, and they trust that ere long the public will duly appreciate the advantages of your undertaking ; and notwithstanding the exhausted state of your finances, your committee look forward with unabated confidence to a period not very far distant, when the revenue which the promoters of this important measure calculated would arise will be fully realised.

“ Your committee are assured by the engineer that the main line,

with the Darlington and Yarm branches, and part of the Hagger Leases branch, will be ready for public traffic by the 26th inst., and your committee recommend the grand opening of the railway to take place on the following day.

“Your committee wish to state, that a part of the main line has not received that finish which it is their intention to give it, owing to the difficulty of procuring gravel and stones, but they trust that in a little time they will be enabled to complete the whole line, and it is some satisfaction that, whilst they are proceeding to finish the line, no interruption will take place to the traffic.

“Your committee has provided one locomotive engine and 150 wagons, which will be in readiness for the opening of the railway on the 27th inst.

“From the inquiries your committee has made, they are satisfied that it will greatly conduce to the interest of the company that they should become the principal carriers on the line, and with that view they have been led to provide the engines and wagons above stated.

“Your committee have received an application from Mr Chaytor for leave to use a locomotive engine on the railway, but they are of opinion that it would be improper to grant the application.

“An application has been made by a deputation from Croft Bridge to the vicinity of Richmond, who propose that the Railway Company should extend the Croft branch into Yorkshire for about a mile; but upon considering the heavy expense that the company would incur, as proposed, by a bridge across the Tees, and an inclined plane forming part of the works, your committee are decidedly of opinion that the proposition cannot be entertained.

“The expenditure has far exceeded the engineer's estimate, and many parts of the works have proved more expensive than you were led to believe; but your committee beg leave to call attention to the following items of disbursement as accounting for a great part of the excess, and which have arisen in the purchase of land and damages to tenants, exceeding by £18,000 the estimate made as to the value of the land, together with the great expense of erecting occupation bridges, which your committee did not anticipate, and the difficulties and consequent expense of obtaining stones and other materials for forming the way.

“The items alluded to are as follows: Law and Parliamentary expenses, £4230; main line, for land and damages, £25,000, exceeding the estimate by £18,000; 150 coal-wagons and 200

ballast-wagons, £4000 ; self-acting inclined plane at Brusselton Quarry, £2000 ; committee expenses, £184 ; engineers', agents', and clerks' salaries, £5442 ; expenses in opposing the Tees and Weardale Railway, £34,241.

“ Your committee beg to repeat their conviction that your concern will soon obtain that rank and credit in the kingdom to which it is entitled.”

After hearing the above report, the general meeting of shareholders, held on the same day, resolved :—

“ That the cordial thanks of this company are due, and are hereby given, to the committee for the talents and zeal they have displayed in the execution of the important works committed to their charge. It appearing from the report of committee that the main line of the Darlington and Yarm branches will be ready for public traffic on the 27th instant—Resolved, that this meeting adjourn to that day, and this committee are requested to make the necessary preparations for the public opening of the railway on that day ; and that the proprietors do dine together at the Town Hall in Stockton—Resolved, also, that each proprietor have one ticket, and that ten extra tickets be at the disposal of the chairman, and that each shareholder having ten shares and upwards be allowed an extra ticket for every ten shares.”

CHAPTER IX.

THE TWENTY-SEVENTH OF SEPTEMBER.

THE opening day of the Stockton and Darlington Railway had at last arrived. To say that the event was looked forward to with much interest, would be to put it in the mildest possible way. There are, probably, not many people of mature years who cannot recall to memory their first impressions on seeing a railway train in motion. Few circumstances lay such an indelible hold on the imagination ; and, looking down through the long vista of years, we require but a feeble effort to live over again such a wondrous realisation of high-strung hopes and distended expectations. But in 1825, the railway system had not become an accomplished fact. Lines of tramway had been opened here and there for the convenience of colliery proprietors ; but being private property, they were little known, and never used, by the great mass of the people, while horses or stationary engines were the motive power mainly employed. Here, however, was a public railway projected and carried out on a scale of magnitude and novelty not hitherto approached, and furnished with the then unfamiliar accessory of steam locomotion. It had other features, not needing to be enumerated, which made it otherwise unique. It was destined to set at rest all doubts and to dispel all illusions as to the practicability of railway locomotion. Pessimist croakers did not scruple to affirm that the Peases

and their coadjutors were more fit for Bedlam than anything else. Ideas of this sort were even countenanced by men of high position and education. Lord Eldon wrote that, "as to railroads, and all the other schemes which speculation, running wild, is introducing, I think Englishmen, who were wont to be sober, are grown mad." Even Nicholas Wood, who was all along in the van of railway progress, and who could see further ahead than most men, declared: "It is far from my wish to promulgate to the world that the ridiculous expectations, or rather professions, of the enthusiastic speculist will be realised, and that we shall see them travelling at the rate of twelve, sixteen, eighteen, or twenty miles an hour. Nothing could do more harm towards their adoption or general improvement than the promulgation of such nonsense."

The following announcement was made in the local newspapers as to the arrangements for the opening ceremony:—

"Stockton and Darlington Railway.

"The proprietors of the above concern hereby give notice, that their main line of railway, commencing at Witton Park Colliery, in the west of this county, and terminating at Stockton-upon-Tees, with the several branches to Darlington, Yarm, &c., being in extent about twenty-seven miles, will be formally opened, for the general purposes of trade, on Tuesday, the 27th instant. It is the intention of the proprietors to meet at the permanent steam-engine, erected below the tower at Brusselton, near West Auckland, and situated about nine miles west of Darlington, at 8 o'clock A.M., and after inspecting their extensive inclined planes there, proceed at 9 o'clock precisely, by way of Darlington and Yarm, to Stockton-upon-Tees, where it is calculated they will arrive about 1 o'clock. An elegant dinner will be provided for the company who may attend, by Mr Foxton, at the Town's Hall, Stockton, at 3 o'clock, to which the proprietors have resolved to invite the neighbouring nobility and gentry who have taken an interest in this very important undertaking. A superior locomotive

engine, on the most improved construction, will be employed, with a train of convenient carriages, for the conveyance of the proprietors and strangers. Any gentleman who may intend to be present on the above occasion will oblige the company by addressing a note to their office in Darlington as early as possible.

"STOCKTON AND DARLINGTON COMPANY'S OFFICE,
September 14, 1825."

The following handbill was issued five days afterwards, and affords a more correct knowledge of the detailed arrangements:—

THE
STOCKTON & DARLINGTON
RAILWAY COMPANY

Hereby Give Notice,

THAT the FORMAL OPENING of their RAILWAY will take place on the 27th instant, as announced in the public Papers.—The Proprietors will assemble at the Permanent Steam-Engine, situated below BRUSSELTON TOWER, about nine Miles West of DARLINGTON, at eight o'clock, and, after examining their extensive inclined Planes there, will start from the Foot of the BRUSSELTON descending Plane, at nine o'clock, in the following Order:—*

1. THE COMPANY'S LOCOMOTIVE ENGINE.
2. The ENGINE'S TENDER, with Water and Coals.
3. SIX WAGONS, laden with Coals, Merchandise, &c.
4. The COMMITTEE, and other PROPRIETORS, in the COACH belonging to the COMPANY.
5. SIX WAGONS, with Seats reserved for STRANGERS.
6. FOURTEEN WAGONS, for the Conveyance of Workmen and others.

 *The WHOLE of the above to proceed to STOCKTON.*

7. SIX WAGONS, laden with Coals, to leave the Procession at the DARLINGTON BRANCH.

* Any Individuals desirous of seeing the Train of Wagons descending the inclined Plane from ETHERLEY, and in Progress to BRUSSELTON, may have an Opportunity of so doing, by being on the RAILWAY at ST HELEN'S AUCKLAND not later than Half-past Seven o'clock.

8. SIX WAGONS, drawn by Horses, for Workmen and others.
9. Ditto. Ditto.
10. Ditto. Ditto.
11. Ditto. Ditto.

THE COMPANY'S WORKMEN to leave the Procession at DARLINGTON, and DINE at that Place at ONE o'clock; excepting those to whom TICKETS are specially given for YARM, and for whom Conveyances will be provided, on their Arrival at STOCKTON.

TICKETS will be given to the Workmen who are to dine at DARLINGTON, specifying the Houses of Entertainment.

THE PROPRIETORS, and such of the NOBILITY and GENTRY as may honour them with their Company, will DINE precisely at THREE o'clock, at the TOWN HALL, STOCKTON.—Such of the Party as may incline to return to DARLINGTON that Evening, will find Conveyances in waiting for their Accommodation, to start from the COMPANY'S WHARF there precisely at SEVEN o'clock.

THE COMPANY take this Opportunity of enjoining on all their WORK-PEOPLE that attention to *Sobriety* and *Decorum* which they have hitherto had the Pleasure of observing.

THE COMMITTEE give this PUBLIC NOTICE, that all Persons who shall ride upon, or by the sides of, the RAILWAY, on Horseback, will incur the Penalties imposed by the Acts of Parliament passed relative to this RAILWAY.

RAILWAY OFFICE, *Sept. 19th, 1825.*

The committee, according to notice, assembled at the bottom of Brusselton engine plane, after inspecting the Etherley engine, near West Auckland; and the carriages, loaded with coal and merchandise, were drawn up the eastern ridge by the Brusselton engine, a distance of 1960 yards, in seven and a half minutes. They were then lowered down the plane, on the east side of the hill, a further distance of 880 yards, in five minutes. At the foot of the plane the locomotive engine was ready to receive the carriages, while a large gathering of spectators looked on with mingled admiration, wonder, and awe.

As a precaution against possible accident, and perhaps, also, to give a more imposing effect to the procession, the

company engaged men to ride on horseback in front of the engine. These heralds held flags in their hands, and gave notice to all whom it concerned that the locomotive was approaching.

The chairman of the company, in recording the day's proceedings, states that "about eight o'clock, thirteen wagons, twelve of them laden with coals, the others with sacks of flour, the whole covered with people, were drawn up the inclined plane near Brusselton, in admirable style, amidst the cheers of thousands, by means of two powerful steam-engines of thirty horse power each. They then descended the descending plane, and took their stations in the procession. After the necessary lapse of time in making arrangements, the procession began to move in the following order:—The company's locomotive engine, the engine's tender for supplying it with fuel and water, five wagons laden with coals, one with flour, and one containing surveyors, engineers, &c., the committee and their friends in the long coach belonging to the company, six wagons with strangers, fourteen wagons with workmen and others, six wagons laden with coals. The whole of the above were attached to, and moved by, the locomotive engine. Then followed fourteen wagons filled with workmen and others, drawn by horses. Flags with the following inscriptions were displayed on four of the wagons:—1. A large white flag, inscribed 'Stockton and Darlington Railway, opened for public use 27th September 1825. Periculum privatum utilitas publica.' Beneath this motto a landscape with the locomotive engine and wagons. 2. A second flag with the above motto. 3. 'Prosperity to the Stockton and Darlington Railway.' 4. 'May the Stockton and Darlington Railway give public satisfaction, and reward its liberal pro-

moters.' The scene on the morning of the procession sets description at defiance. The universal cheers, the happy faces of many, the vacant stare of astonishment of others, and the alarm depicted in the countenances of some, gave variety to the picture. The whole train now moved at the rate of from ten to twelve miles an hour, with a weight of at least eighty tons, drawn by one engine." At Darlington, "two additional waggons, containing Mr Meynell's band, were attached in rear of the company's coach, playing at intervals cheering and appropriate airs." From the points between Yarm and Stockton, where the railway separates from the turnpike, "the descent is more rapid, and the motion was accelerated to the rate of fifteen or sixteen miles an hour;" and "on reaching the company's wharf, a salute of twenty-one guns was fired, the band striking up 'God Save the King,' which was followed by three times three stentorian cheers."

Tickets entitling their holders to take part in the procession were distributed to the number of nearly 300, but about double this number got into or clung to the wagons to enjoy the novelty of the ride. A number of horsemen galloped across the fields to join the cavalcade, which was still further reinforced by many people on foot, who succeeded in keeping up with the engine for a great part of the way. The weight of the train, including passengers and merchandise, was calculated at nearly ninety tons. Descending towards Darlington, full steam was put on, in order to ascertain at what rate of speed the engine could travel with safety, and for some distance a speed of twelve miles an hour was kept up. The train reached Darlington in sixty-five minutes, exclusive of stops, being at the rate of about eight miles an hour. Here six carriages or

wagons full of coal were left ; and after obtaining a fresh supply of water, and taking on board a band of music, and other passengers belonging to Darlington, the train was again put in motion. Stockton was reached in three hours and seven minutes after leaving Darlington, including all stoppages, and one of unusual length at Yarm, where some coal wagons were left, the distance between the two towns being close on twelve miles. All along the line of route the fields, lanes, and bridges were covered with spectators ; and when the procession arrived within a few miles of Stockton, it was joined by a large number of horses, vehicles, and foot-passengers. One who has narrated the incidents of the opening ceremony graphically remarks, that "the passengers by the engine had the pleasure of cheering their brother passengers by the stage-coach, which passed alongside, and of observing the difference between the engine with her six hundred passengers and load (of eighty tons) and the coach with four horses and only sixteen passengers."

Many curious recollections of the opening ceremony are preserved by those who were present ; and of those who were present, it is rather remarkable that so many are still alive. One can scarcely even now meet with a man or woman of advanced years between Auckland and Darlington, both inclusive, who did not "assist" in the opening celebration. It was commonly reported at the time, and has since been handed down as a reminiscence of the event, that the whole of the inhabitants turned out to witness the advent of the "iron horse," save and except two old ladies whose infirmities or prejudices, or both combined, prevented them from rendering so marked a meed of homage to the new era. Great excitement prevailed among the spectators

as the engine came in sight. Excitement in many minds took the form of disappointment when it was found that the locomotive was not built after the fashion of a veritable four-footed quadruped, some of the older folks expecting to see the strange phenomenon of an automatical semblance of a horse stalking along on four legs. But everybody admitted that the performance of old "Locomotion" was wonderful in its way, and vigorous cheering greeted its approach.

There could be no more interesting memorial of the opening of the first passenger railway than a volume made up of the absurd incidents and *outré* impressions that prevailed concerning it. To gather these from the lips of survivors, and put them into a form worthy of permanent preservation, must be reserved for some future chronicler of the times. But one or two incidents may be here mentioned, as showing the extreme ignorance that prevailed concerning the mechanism of the locomotive. When the engine-driver was taking in a supply of water at Darlington, on the opening journey, a large number of people rushed up to have a good look at it. At this juncture the engine-driver turned the gauge-cock for the purpose of testing his steam, and the people surrounding the engine, fearful of an explosion, or perhaps dreading something still more "uncanny," engaged in a regular stampede, hurrying off helter-skelter in all directions, upsetting each other in an adjoining gutter, and most of them taking good care to place themselves a long way out of the reach of possible danger.

The late Mr Joseph Pease was wont to tell an amusing anecdote concerning an old farmer who turned out to see the No. 1 engine and its freight on the opening day. It was the first thing of the kind that the old gentleman had ever set his eyes on; and he naturally enough examined it

with as much curiosity as if it had been a new threshing-machine. But the *rationale* of the motive power greatly bothered him; and when the engine stopped at Fighting Cocks on the route between Darlington and Stockton, he advanced to Mr Pease, who was on the engine, and asked him if they pulled the engine "by them things," referring to the side-bar on which Mr Pease was resting his hand.

CHAPTER X.

MORE ABOUT THE OPENING DAY.

SYDNEY SMITH has said that if England were to be overtaken by an earthquake, the inhabitants would be found dining in the ruins. It came to pass, as a matter of course, that the opening ceremony concluded with a banquet, held in the Town Hall of Stockton. Perhaps there never was a more fit occasion for men to make merry and hold high carnival, for the Stockton and Darlington Railway Company had just consummated the greatest idea of modern times. Another dinner will be held at Darlington to celebrate the "railway jubilee." Between the dinner held at Stockton on the 27th of September 1825, and the dinner to be held at Darlington on the 27th of September 1875, a comparison will probably be suggested to other minds than that of the writer. The one party rejoiced that the foundations had been laid. The other will rejoice because the superstructure has been so far completed—yet how far from being complete! On the changes that have occurred in the interval comment is needless. Most men will have little difficulty in forging a mental chain which will stretch from the one celebration to the other. If any links should be amissing, they may be found on further perusal of the present volume.

Mr Meynell, the chairman of the new company, occupied the chair at the dinner of the 27th September 1825. In addition to the shareholders and officials of the company, a

number of guests were invited; and it is not unworthy of remembrance that the chairman of the Liverpool and Manchester Railway Company, then newly projected, and the first chairman of another of the earliest railways—the Liverpool and Birmingham line—were among those present. The chairman of the first railway company, in concluding his record of the day's proceedings, remarked that “the prospects of the company are now most flattering. Whilst they have the satisfaction of seeing the price of coal reduced one-third to the public, they have the strongest grounds to expect a much larger tonnage to pass on their road than was originally anticipated. An export trade is *now certain*; for one order has been already contracted for 100,000 tons of coal annually for five years by *one house* alone in London, the produce of which alone to the company will more than pay 4 per cent. on their whole expenditure. The shares are now valued at £40 premium each. Plenty of purchasers, but no sellers.”

Thus happily began the greatest innovation of the nineteenth century. Galileo, when in the face of the Inquisition that threatened his life he proclaimed that “it moves still,” was not considered more rash and iconoclastic in his day and generation than were the apostles of the railway system in theirs. They were, indeed, the true iconoclasts. They destroyed pernicious errors and gross delusions. They uprooted prejudice, and laid the axe to the root of superstition. But they upset nothing that was not hindering the march of progress. They subverted no truth or institution that was worth preserving. In place of the cherished usages and traditions which they broke up and disestablished, they founded a new era of promise and progress—an era that was destined materially to aid Great Britain in taking up

her proud pre-eminence in commerce and civilisation, and make her the wealthiest and most prosperous nation of modern times. Had ancient Greece and Rome been able to reckon railways among their institutions, Marius might have been kept from mourning over the ruins of Carthage. For want of railways the old world was handicapped. By means of its railway system, the modern "mistress of the world" has eclipsed all the greatest and grandest achievements of nations whose vaunted superiority in literature and art we have never, in our more mechanical age, ceased to admire and emulate.

Such reflections, although obvious and natural enough at this hour, were probably very far from the minds of the men who inaugurated the railway era. While we know that they had hopeful confidence in the issue of their plans, it would be too much to assume that they undertook them without some degree of faltering. But if "fear and trembling" caused them now and again to pause and reflect on the chances which, by "the strange vortices in the world's atoms," they had made up their minds to meet, we have nothing to show that they ever discussed or meditated a recantation of their opinions or a retracing of their steps. On the contrary, they threw misgivings overboard, firmly persuaded that

" Our doubts are traitors,
And make us lose the good we oft might win
By fearing to attempt."

The limits assigned to this work will not permit us to travel far beyond the evidence and incidents relative to the career of the Stockton and Darlington Railway, but as the construction of the Liverpool and Manchester Railway has a strong collateral relation to that career, we shall here briefly allude to the circumstance of its formation.

It has been alleged over and over again that this line was opened about the same time as, if not previous to, the Stockton and Darlington Railway. But the Bill authorising its construction did not pass through Parliament until 1826, and the line was not opened until the 15th of September 1830—a day that added to its other memorabilia the tragic death of Huskisson. While the Bill was still under consideration, Mr Henry Booth, the first secretary, and subsequently the historian, of the Liverpool and Manchester line, addressed the following letter to Mr Edward Pease:—

“ROYAL HOTEL, ST JAMES STREET,
LONDON, 10th March 1825.

“ED. PEASE, ESQ.

“DEAR SIR,—I take the liberty to address you on behalf of the Liverpool and Manchester Railway. Our Bill is now before Parliament, and we are, of course, anxious to strengthen our case on every side as much as possible. We understand our opponents mean to represent the Darlington Railroad as a complete failure. This differs very much from our own idea of the fact. May we trouble you to transmit to us some correct information on the subject; that is, whether the rail is found strong enough to carry the weight which is now moved or intended to be moved upon it, whether the *breakages* are frequent, and whether the rail bends when it does not break. The strength of the rail, I believe, is twenty-eight lbs. per yard. In short, does it answer? and is it likely to continue to answer the purpose for which it has been constructed?

“I was at Darlington last spring with Mr Ellis and Mr Saunders, and we certainly carried back with us a very favourable impression of the principle on which the rail is constructed. Mr Stephenson also (who is here) has just shown me a letter from Mr Mewburn, speaking of your road in very favourable terms.

“May I beg the favour of an *early* reply.—I am, dear sir, yours
most obly.,
HY. BOOTH.”

A great fight took place on this Bill, chiefly with respect to the motive power to be employed. It was still a moot-point whether a railway was or was not a more cheap and

expeditious mode of transit than a canal. It was admitted by the promoters of water-navigation that the existing traffic was 1200 tons per day, that the shortest distance by the canal was fifty miles, and that the average time taken to perform the voyage between Liverpool and Manchester was thirty-one hours, the charges being 5s. 2d. per ton, but reduced in consequence of the proposed opposition to 3s. 8d. and 3s. 4d. per ton ; whereas the promoters of the railway stated the distance at thirty-one miles, and engaged to convey goods at the rate of five to six miles an hour, and from twenty to thirty per cent. below the canal charges. George Stephenson was examined for four days before the committee, and assigned to the locomotives then in use a power of twenty tons at eight miles an hour, with capabilities of taking thirty tons at eight miles, and of travelling at the rate of twelve miles an hour. Mr Nicholas Wood, however, assigned a power of fifty tons gross, at six miles an hour, with capabilities, by increased power, of taking that weight at any speed between six and twelve miles an hour. Greater results were achieved than either of these gentlemen anticipated, for Messrs Walker and Rastrick, in March 1829, estimated the capabilities of a ten-horse engine for the Liverpool and Manchester Railway at sixty tons gross, at five miles an hour, thirty-seven and a half tons at eight miles an hour, and thirty tons at twelve miles an hour. "The construction of the Liverpool and Manchester Railway," says Wood, "and the results elicited by the experiments of the locomotive engines thereon, virtually established the system of railways. The entire superstructure was not then raised, but the foundation was firmly and securely laid."

CHAPTER XI.

THE FIRST RAILWAY COACHES.

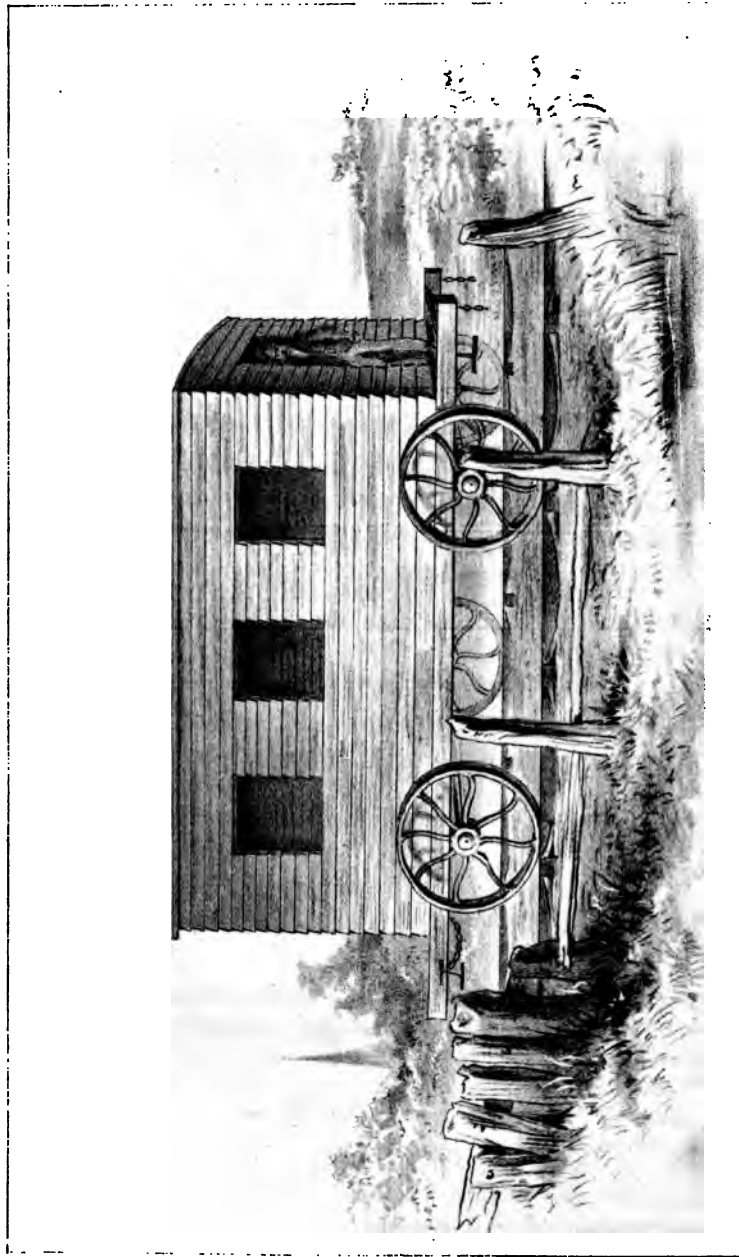
THERE is no more curious chapter in the history of the railway system than that which relates to the initiation of passenger traffic. The promoters of the Stockton and Darlington Railway did not in their early estimates calculate upon any revenue worth speaking of from this source. Travelling was in those days an expensive and time-wasting luxury, which only those well-to-do could afford to indulge in. People were less migratory in their habits, and in many a community the oldest inhabitant had lived and died without having travelled beyond a circumference of fifty miles from the place of his birth. Between Darlington and Stockton there was scarcely passenger traffic enough to afford a reasonably profitable return to the owner of the only coach that ran three or four times a week on the regular turnpike road. There was little to encourage the hope that the advent of the rail and locomotive, without the promise of greater speed, would tend to induce greater facilities of travel, or a greater disposition to indulge in peripatetic habits. Hence the railway did not make any special provision for the cultivation of passenger traffic. It was originally intended to allow the proprietors of stage-coaches or other conveyances plying on the route of the proposed new railway to make use of the line on certain specified conditions; and

it was also part of the original project to allow wagoners or carriers to make use of the line on a footing which made them altogether independent of the railway company. Nor was it until some time after the opening ceremony that the company determined to become the principal carriers of minerals and merchandise on the line, some of the promoters being of opinion that it would pay better, and tend more to the convenience of the company, if they simply imposed a certain rental for the use of the railway by carriers already established.

The earliest record of the intention of the company to undertake the carriage of passengers appears in a minute of the sub-committee, dated the 7th October 1825, which provided that a licence should be obtained from the magistrate for leave to run a coach on the line, so that when the line was opened for traffic on the 27th of the preceding month, the company had no authority to make use of coaches.

About this time, an application was made to the company by one Thomas Close, to run a coach between Darlington and Stockton, at two guineas per week. This offer was accepted, and the company advanced him the sum of £25, on finding security to purchase a horse and harness for this purpose. Whether Thomas Close was "a friend of publicans" does not appear on the record, but the company took care to ensure his sobriety by informing him that "the first time he is seen intoxicated he will be dismissed, and the sum due to him as wages shall be forfeited."

It was not until October 1825 that the company commenced to run a coach of their own. The following is a copy of their programme and the conditions prescribed for passengers :—



The "Experiment" First Railway Passenger Coach, 1825.

STOCKTON & DARLINGTON RAILWAY.

THE COMPANY'S COACH

CALLLED THE
EXPERIMENT,

Which commenced Travelling on MONDAY, the 10th of OCTOBER 1825, will continue to run from *Darlington* to *Stockton*, and from *Stockton* to *Darlington*, every Day [Sundays excepted], setting off from the DEPOT at each place at the times specified as under, (*viz.*) :—

ON MONDAY,

From Stockton at half-past 7 in the Morning, and will reach Darlington about half-past 9 ; the Coach will set off from the latter place on its return at 3 in the Afternoon, and reach Stockton about 5.

TUESDAY,

From Stockton at 3 in the Afternoon, and will reach Darlington about 5.

On the following Days, viz. :—

WEDNESDAY, THURSDAY, & FRIDAY,

From Darlington at half-past 7 in the Morning, and will reach Stockton about half-past 9 ; the Coach will set off from the latter place on its return at 3 in the Afternoon, and reach Darlington about 5.

SATURDAY,

From Darlington at 1 in the Afternoon, and will reach Stockton about 3.

Passengers to pay 1s. each, and will be allowed a Package of not exceeding 14 lb., all above that weight to pay at the rate of 2d. per Stone extra. Carriage of small Parcels 3d. each. The Company will not be accountable for Parcels of above £5 Value, unless paid for as such.

Mr RICHARD PICKERSGILL at his Office in Commercial Street, Darlington ; and Mr TULLY at Stockton, will for the present receive any Parcels and Book Passengers.

One of the earliest passengers by the "Experiment" coach has thus described some of its more remarkable features, and the sensations of the journey between Stockton and Darlington :—

"The coach had no springs of any kind, and yet the motion was fully as easy as in any coach on the road. A very slight jolt is felt, accompanied with a click or rattle, every time the wheels pass over the joints of the several rails, and also at the breaks which occur at the different passing places, and then, if anything, feels harsher than in a coach. At any bends of the road, or other places where the view is obstructed, the coachman blows a horn to give warning of his approach to any wagons or vehicles that may be coming or going on the way. Some parts of the way were laid with rails of cast iron, joined at every four feet, and in coming upon these, the jerks and jolts were more frequent, more audible, and more sensible, resembling exactly, as the coachman justly observed to us, the clinking of a mill hopper."*

In November 1825, application was made by George Craddock and Matthew Muir for permission to run coaches on the line for twelve months; but their request was, for some unexplained reason, not complied with. About the same date, however, a contract was made with Richard Pickersgill for running a coach on the railway, and Pickersgill's coach was the principal for some time. In May of the following year, opposition was threatened in the conveyance of passengers between Darlington on the one hand and Stockton and Yarm on the other; and consequently the agreement made with Pickersgill was modified to the extent of reducing the dues upon all carriages conveying passengers on the line to threepence per mile. This same Richard Pickersgill was the lessee of the company's first coach, previously referred to as the "Experiment;" and on

* Longstaff's History of Darlington, p. 363.

the 20th day of May 1826, we find the company limiting the contract with him to "still use the privilege of employing the company's coach called the 'Experiment' for twelve calendar months from the date of his former contract, and to give him upon the settlement of his account this month the sum of £5, as an acknowledgment, over and above all profits hitherto received by him, as a consideration for rescinding the agreement."

Incidental allusion may here be made to the fact that, in those days of slow locomotion, it was no very difficult thing to overtake the engines running on the line, and many people seem to have taken advantage of this circumstance to enjoy a journey on the cheap. This practice became at last intolerably common. The engine-driver could not apply the "whip behind," which is generally found a sufficient remedy for the putting down of small boys who hang on to other conveyances; and it would have been inconvenient to stop the train every time the nuisance required to be abated. There was, moreover, reason to believe that the engine-drivers winked at, if they did not actually profit by, a custom that was inimical to the interests of the coach proprietors. The company, therefore, after considering the evil and the mode of its cure, caused the following notice to be printed and distributed along the line, and in the adjacent towns and villages:—

"WHEREAS several persons have lately, in defiance of the laws and byelaws of the company, been observed riding upon the locomotive engines and also upon the wagons used for the conveyance of coal, lime, and merchandise, thereby endangering their own lives, and obstructing those employed on the way, it is resolved that the pains and penalties imposed by the said byelaws will henceforth be duly inflicted, and all wagoners, enginemen, and others passing along the said railway, are hereby warned against the said practice. The

agents, foremen, and labourers in the company's employ are required, on the pain of the said penalties, to report and inform on any breach of the said laws in this respect, and any person will be handsomely rewarded on the conviction of any offenders.—By order,

“RICHARD OTLEY.”

Up to 1830 the different coach proprietors on the line appear to have had pretty much their own way, in so far as the regulating of their hours and traffic was concerned. On the 22d of January in that year the company ordered that the following regulations should, from the 1st of the following month, be attended to :—

“1. Richard Pickersgill's coach shall, from the 1st day of February next, leave the railway company's coach station at a quarter past eight o'clock every morning, and continue to start at that time throughout the months of February, April, and June ; and at a quarter past nine o'clock each morning during the months of March, May, and July.

“2. That Richard Scott's coach shall, on and after the 1st day of February next, leave the station aforesaid at a quarter past nine o'clock every morning during the months of February, April, and June ; and at a quarter past eight o'clock every morning during the months of March, May, and July.

“3. That the coach which shall have first left Darlington shall on all occasions leave Stockton during the months of February, March, and April, at two o'clock in the afternoon, and during the months of May, June, and July, at three o'clock. That the second coach from Stockton shall, during the months of February, March, and April, leave Stockton at three o'clock, and during the months of May, June, and July, at five o'clock.

“4. That for the greater accommodation of the public, an exception shall be made in the above order and regulations on market days, when the second coach from Darlington shall be allowed to start at half-past eight o'clock, in lieu of a quarter past nine o'clock, and at four o'clock, in lieu of three o'clock, from Stockton.

“PENALTY—

“The driver of any coach or other carriage for the conveyance of

passengers refusing or neglecting to obey the above orders and regulations for the passage of coaches on the railway, shall be fined in any sum not exceeding 20s. for every offence."

The growth of passenger traffic was very slow, although steadily progressive. Under date of the 2d November 1832, we find a "statement of the number of coaches which have travelled or plied for hire on the Stockton and Darlington Railway during the last twelve months, from the 1st October 1831 to the 1st October 1832; also the number of passengers conveyed thereby per week; also the number of journeys made by each coach; also the distances for their respective stages; also the number of miles passed over in the said year, with the duty charged and paid in respect thereof." From this statement we take the following particulars :—

"Pickersgill & Company's coach, travelling between Darlington and Stockton—length of stage, 12 miles; number of journeys per week, 12; number of passengers per week, 126; average number of passengers per journey, $10\frac{1}{2}$.

"Scott & Company's coach, travelling between Darlington and Stockton—length of stage, 12 miles; number of journeys per week, 12; number of passengers per week, 124; average number of passengers per journey, $10\frac{1}{3}$.

"Ludley & Buckton's coach, travelling between Darlington and Stockton—length of stage, 12 miles; number of journeys per week, 12; total number of passengers per week, 218; average number of passengers per journey, 18.

"Messrs Adamson's coach, travelling between Darlington and Sildon—length of stage, 8 miles; number of journeys per week, 12; total number of passengers per week, 74; average number of passengers per journey, 6.

"Messrs Wastell's coach, travelling between Darlington and Yarm—length of stage, 9 miles; number of journeys per week, 2; total number of passengers per week, 42; average number of passengers, 21.

"Messrs Wastell's coach, travelling between Yarm and Stockton—length of stage, 4 miles; number of journeys per week, 2; total

number of passengers, 42 ; average number of passengers per journey, 21.*

“Messrs Harris’ coach, travelling between Stockton and Middlesbrough—length of stage, $3\frac{1}{4}$ miles ; number of journeys per week, 36 ; total number of passengers, 324 ; average number of passengers per journey, 9.”

It will be seen from the foregoing figures that, up till 1832, the total number of passengers travelling between Darlington and Stockton did not exceed an average of more than 520 per week. It was calculated that the total number of miles passed over by all the coaches on the line in a single year was 37,961. The inside fare by these coaches was $1\frac{1}{2}$ d. per passenger per mile, the outside fare being 1d. per mile. Each coach was calculated to carry 6 inside and 20 outside passengers ; and it is a notable fact that, during the first seven years of the railway’s existence, these coaches carried passengers regularly for a total length of 300,000 miles without injury to life or limb. Each coach was drawn by one horse. Each proprietor took out a licence for himself, paying himself the amount of duty then exigible by the State for the carriage of passengers, and rendering to the railway company no account whatever, except that of the total number of journeys which each coach had made per month.

From a memorial which the Stockton and Darlington Railway Company presented to Parliament in 1832, against an Act passed in the session of 1831–32 “for regulating the duties to be paid on stage-coaches and other carriages,” it appears that the company was made responsible for certain exigencies which they could not control, and, among others, for the restriction of the number of passengers travelling

* The journey from Yarm to Stockton was a continuation of that from Darlington to Yarm.

on their line. In remonstrating against this enactment, the company pointed out that the Act of Parliament contained no authority to enable them to limit the number of passengers travelling on the line, and that "any person is at liberty to use and run a carriage on the railway, provided he complies with the byelaws of the company." In this memorial, moreover, the company declared that "the amount of duty payable in respect of coaches had been increased more than fivefold, showing a large increase of passenger traffic ; but we cannot forbear to state, that if you refuse to enter into an arrangement for the composition of the dues payable, we will be placed in a situation of great danger and difficulty, by reason that the maximum fare allowed to be charged by us is sixpence per mile ;" and, in concluding, the memorialists offer "to compound with the Treasury for a term of five or seven years for the sum of £200 per annum," for the privilege of employing as many coaches as the necessities of the district might require.

While the coaching trade on the Stockton and Darlington Railway was carried on by different proprietors, independently of the company, horses alone were used ; but about 1833 the company began to find that it would be more convenient and advantageous if they took the whole carrying trade into their own hands, and superseded horses by steam locomotion. The first result of their conclusions is made apparent on the 30th August 1833, when they authorised William Kitching and Richard Otley to make arrangements for commencing a trial next month of locomotive power in the carriage of coaches and wagons ; "and John Graham is directed to superintend the coaches, and advertisement of the intention of the company, and the time of starting, &c., to be immediately distributed."

In September 1833, and probably as a result of the success of these experiments, we find it stated that the proprietors of the different coaches on the line "are intending, at considerable expense, to furnish greater accommodation for passengers." Hearing of this intention, the committee empowered William Kitching and Henry Pease to enter into negotiations with the coach proprietors for the supply of suitable wagons, and to "effect any other changes to any extent which may appear to them eligible on the part of this company in the coaching establishment." One of these "other changes" speedily took the form of overtures for the complete acquisition of all the carrying facilities by the railway authorities. To this arrangement the coach proprietors were at first disposed to turn a deaf ear, but they were met by the company on what were then regarded as generous terms, and as they could not well compete with the company on the ground of the latter, they were induced to relinquish their interests for "value received." On the 4th October 1833, the committee reported to the shareholders that the following sums were due to the respective coach proprietors for buying their interest out:—"Pickersgill & Co., for coach and cars, £36, 10s.; for compensation, £40—total, £76, 10s. Jane Scott, for two coaches, £50; for car and harness, £10; alterations and repairs as per bills, and one coach, £51, 7s. 8d.; compensation, £40—total, £151, 7s. 8d. Hunter & Swenne, for coach, £49; for compensation, £20—total, £69. William Ludley, compensation, £20."

Immediately after these negotiations were completed the company made arrangements for the more comfortable and expeditious carriage of passengers on their system. Their first step was to have a new coach built on an improved

method. This coach was called the "Union," and it was put on the station between Darlington and Stockton in November 1833. The fare exacted for the single journey was 1s. 6d. inside and 1s. outside. Accompanying this coach there were one or two unlined and unglazed conveyances, similar to the second-class coaches which had then been introduced on the Manchester and Liverpool line.

In the same year we find the general committee recommending "that two of the coaches lately purchased be put on springs, kept clean and neat, and charged 2s. inside and 1s. outside, to accompany each train." These coaches would be the prototypes and predecessors of the present first-class carriage; and their introduction would herald the initial distinction of first, second, and third class.

The company had now fairly taken into their own hands the control of all the carrying trade, whether minerals, merchandise, or passengers. From time to time other improvements and alterations were initiated, but these do not particularly call for remark, and we shall take leave of this part of our subject by noticing that on the 7th of April 1834, the company announced that they had commenced running coaches and carriages by locomotives for the conveyance of passengers and goods between Stockton and Middlesbrough "six times per day at present fares, thus forming a regular line of communication *via* Stockton and Darlington with Shildon, Auckland," &c. Comment on the facts contained in this chapter would be supererogatory. Every reader already knows in his own experience what splendid and perfect facilities the railway system now affords for the conveyance of passengers, and

how luxuriously he may perform a journey of hundreds of miles in a saloon or a Pullman car. But few, probably, are aware of the laborious and difficult process of gestation and experiment out of which the perfectibility of the present has been evolved. With this knowledge now within the range of the reader's ken, he may be left to indulge his own reflections.

CHAPTER XII.

EARLY DIFFICULTIES OF THE COMPANY.

As there is seldom happiness enjoyed without alloy, so there is seldom a triumph, mechanical or otherwise, without some countervailing drawbacks and disappointing accompaniments. The Stockton and Darlington line had been completed and opened, the success of the venture had been placed beyond all question, the superiority of the locomotive over any other tractive power had been firmly established, and it might be supposed that nothing more remained for the promoters but to rest and enjoy the beneficent results of their achievement. But there are always those who look upon an innovation with dislike, and seek to stop the chariot-wheels of progress. It was so in this case to a more than ordinary extent. The men who had just consummated the greatest achievement of the age were harassed and worried by the pertinacity with which obstacles were thrown in the way of their project by those who ought to have aided them and held up their hands.

One of the first difficulties which the directors were called upon to meet took the form of a complaint from the country gentry and the Trustees of the Stockton and Barnard Castle Turnpike Road, that the locomotive engine frightened the horses, and ought to be put down as an intolerable nuisance. Most of the agricultural community supported or sympathised with this indictment. One com-

plaint was heaped upon another, and the company was over and over again called upon, sometimes in language not Parliamentary, to prohibit and stop the use of the locomotive engine. But to have done so would have been to abnegate all their purposes and sacrifice the fruits of their long and arduous labours. These complaints, therefore, were unheeded, and the incensed and aggrieved agriculturists eventually filed a bill of indictment against the directors "for allowing and committing a nuisance."

Much interest was taken all over the country in the result of the trial which took place at the Yorkshire Lent Assizes in 1832, before Mr Justice Parke, afterwards Lord Wensleydale. After a long hearing, in the course of which Mr Pease and other promoters of the railway system were examined, the company again came off triumphant. A verdict was returned by the jury to the effect—

"That the Act of Parliament empowered the company or persons authorised by them to use locomotive engines upon the railway; that the railway was made parallel and adjacent to the ancient highway; that it did not appear whether or not the line could have been made in this instance to pass at a greater distance; that the locomotive engines on the railway frightened the horses of persons using the highway as a carriage road: that the locomotives were of the best construction known at the time, and the defendants used due care and diligence in the management of them."

With this verdict the plaintiffs were not content, and the case was argued in the following Trinity Term before Lord Tenterdale and Justices Parke, Taunton, and Littledate. Mr Cresswell (afterwards Sir Cresswell Cresswell of Divorce Court celebrity) appeared for the prosecution, and Mr Pollock (afterwards Sir Frederick Pollock) for the defence. Justice Parke delivered the judgment of the Court in Michaelmas Term 1832. It was entirely in favour of

the company, his Lordship remarking "that an interference with the rights of the public must be taken to have been contemplated by the Legislature, since the words of the statute authorising the use of the engine were unqualified, and the public benefit derived from the railway (whether it would have excused the alleged nuisance at common law or not) showed at least that there was nothing unreasonable in the clause of the Act of Parliament giving such unqualified authority."

Other difficulties continued to beset the company's path before they got into smooth waters. Allusion has already been made to the opposition with which the promoters were threatened from Stockton, where a rival line to the Auckland coal-field was projected. Generous concessions made by Mr Pease quieted the Stockton recalcitrants, and induced the abandonment of the proposed competitive railway. Shortly after the opening of the Stockton and Darlington Railway, however, this opposition was again stirred up, and took a much more determined and dangerous shape. Its chief instigator was Mr Christopher Tennant, who was one of the leading promoters of the scheme for the construction of a canal from Stockton to the Auckland coal-field seven years before, and who had been publicly thanked at a meeting held at Stockton on the 9th June 1818, for "the liberality and public spirit" that had induced him to bring forward the canal project. Under Mr Tennant's auspices, then, the inhabitants of Stockton were led to support a movement for the construction of another line from Auckland to the coal-field of South Durham by the route which Stephenson had suggested—*via* Aycliffe and Shildon—when Mr Pease reminded him that "thou must think of Darlington ;

thou must remember that it was Darlington which sent for thee." Notwithstanding the opposition of the Stockton and Darlington Railway Company, a company was formed at Stockton, and Parliamentary sanction was obtained in May 1828 for making this new line. The directors included Messrs Henry Vansittart, Robert Appleby, W. Skinner, W. H. Skinner, and Henry Blanchard. The capital required was £100,000, in shares of £100 each, and the company obtained borrowing powers to the extent of £60,000. The route of this line was as direct as it could be made between the South Durham coal-field and the banks of the Tees. It joined the Stockton and Darlington line at Sim Pasture, not far from Shildon, and terminated below Stockton, at a place called Haverton Hill. The promoters expected that, as the distance between the South Durham coal-field and the banks of the Tees was shorter by the Clarence line than by the Stockton and Darlington, all the coals intended for export would be carried on the former route. In this expectation they were disappointed. It was necessary for the purposes of the Stockton and Darlington Railway Company that the coal-traffic should, as far as possible, be confined to their own line. Over that line they were carried before they came upon the Clarence Railway, so that Mr Pease and his friends had the destiny of the undertaking pretty much at their own disposal. They therefore imposed a rate equivalent to 4d. per ton per mile for the whole distance between Sim Pasture and the other terminus of the new railway, and made certain stipulations with regard to the use of the coal-wagons which they provided, calculated to prejudice the interests of the Clarence Railway Company. The coal-traffic was not at that time suffi-

cient to afford profitable employment to two rival companies. One of them was bound to go to the wall ; and the directors of the first public railway played their cards so well, that they succeeded in practically retaining the whole of the traffic in their own hands. The Clarence company pursued an unsuccessful career, in spite of their subsequent efforts to create a new metropolis of the iron-trade at Port Clarence or Samphire Batts, on the north bank of the Tees ; and the line fell at last into the hands of the Stockton and Hartlepool Company, under whose management it became a not unimportant section of the route from Leeds to Ferry Hill. Before finally taking leave of the Clarence Railway, we may remark, that there is now a prospect of its entering upon a sphere of greatly extended usefulness. The North-Eastern Railway Company propose to construct a tunnel underneath the Tees between Port Clarence and Middlesbrough, and when this project has been accomplished, the old Clarence line will be the most direct route between the metropolis of Cleveland and the South Durham coal-field.

In two of their earliest and greatest struggles, therefore, the Stockton and Darlington Railway Company came off victorious. But they were called upon to enter into a conflict with another interest, in which their success appeared equivocal. The coal-owners on the Tyne and the Wear did not approve of the proposed new railway. They feared that it would to some extent interfere with their monopoly of the London coal-market—then the most valuable, if not the largest in the country. A strong opposition was consequently got up. The committee to whom the company's bill was referred was an open one, and presided over by Mr Lambton, afterwards Earl of Durham. The promoters of

the new railway had fixed their dues for coals at 4d. per ton and the North Country coal-owners appeared before the committee to urge that while the 4d. per ton should be allowed for land-sale coals, only 1½d. per ton per mile should be charged for coals intended for shipment. The purpose of the coal-owners in proposing this ruinously low rate for export coals was obvious. They wanted to retain the shipping trade in their own hands, and prevent its departure from the Tyne and the Wear. Much as the company objected to the introduction of such a clause, and in spite of their strenuous endeavours to get it thrown out, the committee allowed themselves to be influenced by the representations of the coal-owners, and one of the provisions of the Act recited that the company should only be allowed to charge "for all coal shipped in the river Tees for exportation 1½d. per ton per mile, and for all coal which shall not be shipped in any vessel on the Tees for the purposes of exportation, 4d. per ton per mile."

In the then uncertain state of knowledge as to the cost of railway maintenance, it was thought that this clause would operate to the serious detriment of the Stockton and Darlington Company. The directors were much dispirited and annoyed about their defeat. But it soon turned out that the machinations of the North Country coal-owners had been unavailing. The lower dues allowed for export coal were found to leave a fair profit to the company, and, as we shall afterwards have occasion to show, they largely aided the development of the shipping trade of the Tees ports.

It was not an easy matter for the directors to bring the locomotive engine to the required degree of efficiency. Of its superiority over any other form of motive power they

never had a doubt from the first moment of its adoption. This conclusion had been established by repeated experiments, all resulting in favour of the locomotive. An elaborate series of trials made in the early part of 1827 showed that the cost of carrying 4263 tons by horses was £163, 8s. 10d., whereas by the locomotive—finding labour, oil, coals, and all other consumable articles—the carriage of the same tonnage only cost £70, 6s. 6d., being a difference in favour of the locomotive of £93, 2s. 4d. But the safety of the locomotive was a very different thing from its efficiency. We have already seen that it was complained of because it frightened the horses on the turnpike roads. A similar complaint was made years afterwards against the first engines used on the Manchester and Liverpool Railway, and several engineers examined in support of that Bill flatly denied that any such result would follow from the use of locomotives. But the Stockton and Darlington Railway Company recognised the possibility of danger, and consequently ordered instructions to all drivers to “slow” their engines when approaching a turnpike road. Another difficulty of a still more serious kind arose out of the imperfect combustion of the fuel used for locomotive purposes. Redhot cinders often came out of the engines and lodged in the adjoining fields or plantations, setting fire to whatever was combustible, and causing, in some cases, serious damage. Hence we find that on the 3d of August 1832, John Graham reports to the directors “that a network placed on the top of the locomotive engines appears to be a complete remedy against the emission of hot cinders, which have proved so troublesome.” This remedy, however, did not turn out to be complete after all. On the 10th May 1833, Mr Marshall Fowler of Preston

Hall complained for the second or third time that his plantations had been set on fire; and on being called to book for the failure of his "cinder traps," John Graham was forced to admit that they were not adequate to a complete suppression of the evil, and recommended that they should be supplemented by instructions to the enginemen not to exceed five miles an hour whilst passing any plantation! So much importance was attached to the observance of this rule, that two men were specially detached to watch the plantations at night during the summer season, and prevent as much as possible the excessive speed of locomotives; while the directors instructed Timothy Hackworth, their engineer, to have boards with large figures projected from the chimneys of the engines, so that in case any of the enginemen violated this rule, or proved guilty of other misconduct, the public might have an opportunity of laying information against them! As a still further preventive against the danger of fire, the fuel was changed from Chinley to Black Boy five-quarter seam coal. It is perhaps not an unpardonable digression to state here that the first coals used on the first locomotives were purchased from George Dixon & Company at 3s. 9d. per ton, small coal of the same kind being bought at the same time for 2s. per ton.

Nothing appears to be more remarkable in the annals of the Stockton and Darlington Railway than the exemption from accident which it has always been able to purchase by the exceptional care and prudence of its management. This immunity was as characteristic of the earlier as it has been of the later days of the company. There is, indeed, only one notable exception to the rule, that we have been able to discover, between 1825 and 1830. This was the

blowing up of one of the locomotive engines, in March 1828, causing the death of a man in attendance. But after this misadventure the company redoubled their precautions. They ordered all their locomotives to be tested at Shildon by a pressure of water at least 10 lbs. over the maximum allowed by the safety valve ; and rigorously imposed fines upon firemen who left their engines when there was fire under the grates. Another lamentable accident happened on the line in November 1834. A block of wood had been placed across the rails near to Whessoe, and the engine was thrown off the rails, causing the death of one of the engine-men, named James Cleasby. Of this tragic event, however, it must be remarked that it was due to circumstances which the company could not in any way control.

Although it had been proved long before 1835 that a speed of more than twelve miles an hour was practicable, yet the directors did not consider it expedient to exceed that pace. This view was not shared by the enginemen, who took a peculiar delight in running their engines at nearly their maximum rate of speed, and found great difficulty—as Stephenson previously said he had found, in describing the merits of his locomotive to the promoters of the Liverpool and Manchester line—in keeping them down to anything under twelve miles an hour. But the company were very strict in enforcing compliance with the rules laid down anent this matter. In May 1835, they directed the adoption of a rate of speed not exceeding six miles per hour in the case of locomotive engines only partially spring mounted, “and for obviating any hindrance to the coach trains, in the case of such engines being overtaken by coaches.” In the same month, John Graham was directed to inform all enginemen on the line that fines will be levied

on those who run their engines at a speed exceeding eight miles per hour.

In the original Stockton and Darlington Railway Act, there was no provision compelling the consumption of the smoke of the engines. A clause to this effect was put into the Act authorising the construction of the Clarence line; but in those days the numerous appliances now found more or less effectual for the consumption of smoke were not available, and the carrying out of this condition was found to be so difficult that we do not find it introduced into any of the next subsequent Acts. Smoke is a disagreeable companion at any time. Those who have travelled on some of the Continental railways, where a very dirty quality of coal is consumed, must have a lively recollection of the results of their journeying. But the smoke and dust which so much interfere with the comfort of railway travellers in the present day is nothing compared with the serious inconvenience experienced by the earliest railway passengers, who were not only exposed to clouds of smoke, but on whose heads living fires of coal were literally heaped. This evil, due to causes already mentioned, was endured for some years, but its worst effects were ultimately remedied by affixing a wire gauze at the end of the coaches nearest to the engine.

CHAPTER XIII.

EARLY FLUCTUATIONS OF PROGRESS.

IN a commercial aspect, the early career of the Stockton and Darlington Railway proved to be quite as successful as its promoters anticipated. Notwithstanding the interposition of numerous difficulties, the company had good reason to be satisfied with the average results of their venture. Their progress was not that of "leaps and bounds;" it was steady and uniform, and the shareholders had little experience of the flux and reflux that is common to most commercial speculations. Early in 1827 we find the committee congratulating the proprietors that their project had met with such decided support from the public, and that "those opinions which a few years ago were considered by many to be empty and delusive, had been proved to have had their foundation in clear and intelligent views of the best means of promoting the interests of commerce, and diffusing general prosperity." In this year the line was repeatedly blocked by frequent falls of snow, which caused considerable interruption of traffic; but the tonnage passed over the line had steadily increased. The shipping trade also prospered, and in the first three months of 1827, the export trade carried over the line was found to have considerably exceeded the total annual quantity calculated on when the railway was projected. A paragraph in the report of the directors for 1827 would seem to indicate that the arrange-

ment for the haulage of wagons was far from satisfactory. The report states that "the carrying establishment, into which the concern has been so unwillingly introduced, demands the most serious attention. The rates for the haulage of wagons, &c., so far from being a source of profit, form a constant drain upon your resources, as the expense incurred in providing engines, wagons, and horses, is very inadequately compensated."

The report presented to the shareholders' meeting on the 8th July 1828 announced the continued prosperity of the undertaking. The export coal-trade had greatly increased during the year. The eagerness of the public in distant parts of the kingdom to obtain coals shipped from the Tees was accepted as a token of the high estimation in which the company was held, and held out an encouraging prospect of a further increase of revenue from this source. At the same time, the committee looked upon the greater variety of traffic passing over the line as an evidence that the facilities which the railway afforded were more valued by the public.

In July 1829, the committee presented another report to the annual meeting of shareholders, which is so interesting as to be worth reproduction. After regretting that it was not in the power of the committee to announce the rapid prosperity of the concern, they submit that the following particulars will be found manifestly encouraging, and furnish no occasion to excite despondency in the minds of the proprietors :—

"The defalcations in revenue will be seen to have been the consequence of diminished exports. The competition in the sale of coal on the rivers Tyne and Wear has been such as to induce captains who have been regular customers to the Tees to abandon that river

in favour of our neighbours. From the very low prices at which coal can be purchased in those districts, your committee cannot but recognise the operation of a system so ruinous as to bring with it ultimately those calamitous consequences which will point out a remedy, and enforce its application.

“The exportation of coal has been continued even on a reduced scale. It appears to your committee to have established the position that this district can compete with any other under difficulties of an aggravated description. That the export trade has not yielded fair remuneration to those engaged in it they will venture to assume, but they will further express the opinion that the coal-owners of the Tees have escaped that loss which has been felt so seriously by those with whom they have had to contend.

“Amongst other disadvantages, those arising from the state of the river navigation have been prominent, rapidity of loading and sailing being amongst the grand desiderata in the export trade of coals.

“The various works on the branch to Middlesbrough have been arranged and placed in such training as to promise its completion early next summer. The great delay in the execution of this branch is attributed to the obstacles thrown in the way of your committee by the agents of the See of Durham. Having obtained from a jury that justice which had been so long and so unaccountably withheld, your committee were obliged to submit to further mortifying delays. As the land belonging to the See formed the key to all further proceedings, it was only on obtaining possession of it that your committee were enabled to evince any activity in this part of their duty.

“Your committee concluded publicly to offer premiums for the best and second best plans for the construction of shipping staithes. This attracted the attention of many engineers of talent. After a patient investigation of fifteen plans, varying from £3000 to £120,000, the first premium of 150 guineas was adjudged to Timothy Hackworth, in your own service, and the second to J. Cooke of Yetholm.”

In the next annual report of the company—that for the year ending 13th July 1830—a more decided improvement in the prospects of the company is indicated. The Hagger Leases branch had been opened on the 1st of May preceding, and it was at once apparent that it would become a valuable feeder to the main line. The Croft line had also been opened on the 27th of October 1829, and the

committee state that "it promises to realise the anticipations formed of its being an important acquisition to your undertaking." Great hopes had been entertained as to the results of the opening of the Middlesbrough section, which was expected to take place in two or three months. In the return of coal carried on the railway for land-sale, there was an increase of 4314 tons compared with the returns for the preceding financial year. There had also been a considerable increase in the quantity of coals exported from Stockton; and the agreement which the company had some time previously made with the coal-owners, to induce the cultivation of a greater export trade, was reported to be beneficial to its interests. Nothing really appeared to afford cause for dissatisfaction, unless it were that the facilities which the company were able to furnish were not commensurate with the increasing requirements of trade; and the committee pointed out that "a gradual approximation to a double line of railway, and the more efficient regulation of travelling on the line, are obvious resources" for overcoming this difficulty. Up to this time, however, there had been very little progress made in passenger traffic, and the company were compelled to report that "the amount of revenue from merchandise and coaches has varied but little from former years." The total profit for the financial year had been £5540, out of which the committee recommended the payment of a dividend of five per cent.

CHAPTER XIV.

FURTHER RAILWAY WORKS AND PROJECTS.

A THIRD Act of Parliament was obtained by the Stockton and Darlington Railway Company on the 17th of May 1824. This was an Act "to authorise the company of proprietors of the Stockton and Darlington Railway to relinquish one of their branch railways, and to enable them to make another branch railway in lieu thereof; and to enable the said company to raise a further sum of money, and to enlarge the powers and provisions of the several Acts relating to the said railway." Let the fact be noted, that not only the first Act for the construction of a public railway, but the first three Acts were obtained by the Stockton and Darlington Company; for although the proposal to construct a railway between Liverpool and Manchester was first made in 1822, yet it was not until four years afterwards—as already recorded—that the consent of Parliament was obtained to that undertaking. Attention is more particularly directed to this fact, because the greater noise made by the promoters of the latter line, and the greater magnitude of the works involved in its construction, have invested it with a degree of priority and importance which is really not its due.

A careful consideration of the exigencies and resources of the South Durham coal-field led the company to conclude that it would be better to relinquish the proposed

branch line, commencing near Norlees House, in the township of West Auckland, and terminating at Evenwood Lane, for which powers were obtained in the original Act, and to substitute a line beginning at the north-west end of the village of St Helen's Auckland, passing through the township of St Helen's Auckland, West Auckland, Evenwood and Barony, Lynesack and Softley, Hamsterley and Cockfield, and terminating at Hagger Leases Lane. The works necessary to the making of this branch, which was about five miles in length, were commenced very shortly after Parliamentary sanction had been obtained to the Bill in 1824; but it was not until the 1st of May 1830 that the opening ceremony took place, and the section was not available for full traffic until the 30th of October following. This line, since known as the Hagger Leases branch, has been used for mineral traffic only for some years past.

It was provided in this Bill that the company should make certain jetties for the embankment of the Skerne, opposite to the Ellens, the estate of Mr Edward Pease. The Act authorised the diversion of the Skerne near to the Ellens, and it was feared that the alteration of the course of that stream would be calculated to injure Mr Pease's estate. Section 18 accordingly provided, that in case the company should fail to perform these necessary works, Mr Pease should carry them out at their expense, the reasonable cost of the work to be settled by "two or more justices of the peace," who were empowered to distrain the "goods and chattels of the said company," for the use of "the said Edward Pease," in case they failed to make payment within twenty days after the award. We are not aware that the "father of railways" ever used, or had occasion to use, this power of distraint against the company.

On the 23d of May 1828, Parliamentary sanction was obtained to another Bill for the construction of a line between Stockton and Middlesbrough, including the building of a bridge across the Tees at the former town. The length of this line was about four miles. In the following year a company of far-seeing capitalists purchased an estate of 500 acres which now forms the site of the modern town of Middlesbrough. Young Joseph Pease was the leading promoter of this company, and his co-proprietors were Messrs T. Richardson, H. Birkbeck, S. Martin, Edward Pease, jun., and F. Gibson. The purchase, on the face of it, seemed the reverse of promising. The land was little better than a dismal swamp, and the property upon it was mainly a few farm buildings. But in 1830 the new line from Stockton to Middlesbrough was opened, and in the same year the first shipments of coal from the latter port took place. A notable incident connected with this shipment is mentioned by Longstaff.* An enormous block of coal, weighing upwards of two tons, was sent down by the railway from Black Boy Colliery, near Bishop Auckland. This coal was calculated, when broken up, to make two London chaldrons.

Staithes for the shipment of coal were provided by the new Middlesbrough owners. These were described at the time as a great attraction to the curious. The wagons, laden with coal, were lifted on a platform, 20 feet in height, and lowered to the ship's deck.† Even before the introduction of the iron age, Middlesbrough had attained a considerable degree of prosperity. Between 1801 and 1841, its population—mainly owing to the introduction of the

* History of Darlington, p. 364.

† *Vide* Head's Home Tour.

railway system—had risen from 25 to 5809; and the owners of the Middlesbrough estate had not long to wait before they were permitted to enter into the fruition of their labours.

The construction of the extension from Stockton to Middlesbrough was attended by one of the very few accidents that have happened on the first passenger railway. The Act empowering the construction of that line provided, as already indicated, for the erection of a suspension bridge across the Tees. The building of this bridge was entrusted to Captain Brown, R.N., and great things were expected from it. For more reasons than one, the structure is entitled to something more than a merely passing allusion. It was the first railway bridge constructed over a navigable river, or, indeed, over any stream of considerable size. It was also the first railway suspension bridge. There were not a few who feared that a bridge of that particular kind could not be made to stand the heavy traffic of a railway. But the railway authorities went to work very cautiously. Before allowing the bridge to be used for traffic they caused it to be thoroughly well tested by Alexander Mitchell and Thomas Storey. In the first experiment, carried out on the 10th December 1830, a weight of 18 tons was placed on the centre of the bridge, which showed a deflection of $9\frac{3}{10}$ inches. Further experiments were made on the 17th December, when 28 empty wagons were placed on the bridge, with engine and tender, weighing altogether 37 tons, and extending from one end of the bridge to the other. The result was a depression of $2\frac{3}{10}$ inches. Eight loaded wagons were then placed on the bridge at equal distances, so as to cover the bridge. The weight was 34 tons 1 cwt., and the depression was $2\frac{8}{10}$ inches. In the next test, twelve loaded wagons, weighing 50 tons 9 cwt.,

were placed on the bridge at equal distances, and caused a depression of $4\frac{3}{10}$ inches. Another test was made with sixteen loaded wagons, weighing 66 tons 12 cwt., which were placed on the bridge at equal distances, and caused a depression of $7\frac{4}{10}$ inches. The masonry of both towers was considerably affected by the last experiment, and two of the retaining plates split on the Yorkshire side of the river. It was not, therefore, deemed prudent to add any more additional weight in further trials, but attempts were made to ascertain what number of loaded and empty wagons could in the then state of the structure be passed over at one time. The conclusion drawn from this experiment is stated to have been that any number of empty wagons could be passed over with safety when closely coupled.

There is no doubt that these repeated experiments, while seemingly demonstrating the strength of the bridge, had the effect of weakening a structure that was rather weak at the best. After the conclusion of the experiments, the engineers reported that trade might be carried on with the bridge as it was by passing loaded waggons over one by one, the engine passing over first. It was added, that "the engine might return with the whole train of empty wagons connected closely together," and that "twenty wagons may be passed over in this way in about five minutes, after the man got into the method." This plan was adopted for some time, the bridge, after having once given way, being strengthened by the erection of starlings; but it was not long before it came to be superseded by a more solid and massive structure.

In 1839 the proprietors of the Stockton and Middlesbrough Railway undertook the construction of the Shildon tunnel, with a view to obviating the disadvantages atten-

dant on the use of the Brusselton and Black Boy inclines. The tunnel was successfully completed, and opened with a suitable celebration in 1842—its construction extending over twenty-one months. Its length is 1300 yards, or nearly three-quarters of a mile. Its height is 23 ft. 4 in., and its breadth is 21 ft. at the point whence the arch springs. Its greatest depth from the surface of the ground is about 20 fathoms. During its formation the tunnel was worked by seven shafts from the surface.

The extension of the line to Redcar was opened in 1846, the distance of that town from Middlesbrough being about eight miles. At the other end of the Stockton and Darlington Railway the Wear Valley line had been completed, so that the whole length of road under the control of the company was about ninety miles, nearly forty of which belonged to the Stockton and Darlington Railway proper.

In 1849 another Bill was applied for "to consolidate the several Acts relating to the Stockton and Darlington Railway Company, to enable the company to alter their line of railway in the parish of Egglecliffe and Stockton-on-Tees, and to increase their capital, and to vest in them the Middlesbrough Dock." The Royal Assent was accorded to this Act on the 13th of July. In the Act of 1828, the company were authorised to purchase thirty acres of land for the purpose of making wharfs or quays, for loading or unloading vessels in the Tees. Under their auspices the Middlesbrough Dock was subsequently constructed, and in the Act of 1849 power was taken to vest this dock in the company for the sum of £160,000. Since then the dock has remained in the hands of the company, and within the last three or four years the North-Eastern Board has spent nearly £150,000 additional in its enlargement.

CHAPTER XV.

RAILWAY EXTENSIONS IN CLEVELAND AND SOUTH DURHAM.

FOR some years after the opening of the Redcar and Middlesbrough line, the directors of the Stockton and Darlington Railway did little or nothing in the way of further extending their system in Cleveland. The original purpose of the undertaking had been accomplished. The South Durham coal-field had been brought within easy reach of the shipping ports of the Tees. A large and prosperous trade in coal had sprung up, of which more hereafter. But no one had foreseen the great future that was in store for Cleveland. The iron trade of that district was one of those coming events which cast no shadow before. Messrs Bolckow and Vaughan had established their ironworks at Middlesbrough in 1840; but they did so simply and solely because of the facilities for shipment furnished by that port, and its proximity to the Durham coal-field. The trade of the district below Stockton was otherwise meagre and unimportant.

The event which is now generally designated as the commercial discovery of the Cleveland ironstone took place in 1850. Its immediate consequence was a complete change in the position and prospects of the district served by the Stockton and Darlington Railway Company. New works for the manufacture of both crude and finished iron sprang up

on the banks of the Tees with mushroom-like rapidity. The trade of the ports of Stockton, Middlesbrough, and Hartlepool became enormously developed. Mines were opened out in a ratio of increase only paralleled by the rapid multiplication of the furnaces whose wants they were intended to supply. Capital and labour alike came in like a flood.

The Middlesbrough and Guisbrough Railway, which was projected mainly to meet the expected requirements of the Cleveland iron trade, was opened on the 11th November 1853. The few mines that had been opened out previous to that date were chiefly on the route of the new extension, which soon became one of the most valuable feeders of the Stockton and Darlington system, and of which, we may remark in passing, Mr David Dale was the first secretary.

But when the extension to Guisbrough was first talked of, the events just indicated had hardly come to pass. The projection of that line was strongly opposed by some of the directors and shareholders of the company; but Joseph and Henry Pease carried it to a successful termination in spite of all obstacles, thus affording another evidence of the foresight and spirit which brought about the formation of the original line, and supplying a distinct and early recognition of the great future which, by the application of the Cleveland ironstone, the district was destined to attain.

The Royal Assent was accorded to the Act for the extension from Redcar to Saltburn in 1858, and the formal opening of the line took place on the 19th August 1861. It is mainly due to the construction of this extension, which was originated by Mr Henry Pease, that Saltburn has sprung into existence. Twenty years ago,

there was not a single house on the site now occupied by that very modern fashionable watering-place! Last year plans were passed by the Saltburn Improvement Commissioners for the building of more than 150 new houses! In a few years more Saltburn will not be an unworthy rival of Scarborough, which it already greatly excels in natural attractions. Some years afterwards another extension of the line took place as far as Lofthouse, for the purpose of accommodating the heavy mineral traffic that was growing up on that route. The latter extension has a total length of eight miles. For some years it was used for mineral traffic only, but early in 1875 it was opened for the accommodation of passengers.

At the other end of the Stockton and Darlington system large extensions had meanwhile taken place. One branch was carried from Bishop Auckland to Weardale, under an Act which received the Royal Assent on the 15th July 1837, "for incorporating certain persons for the making and maintaining of a railway from near the Black Boy branch of the Stockton and Darlington Railway, in the township of St Andrew's Auckland, to or near to Witton Park Colliery, with a branch therefrom, all in the county of Durham, to be called the 'Bishop Auckland and Weardale Railway.'" The promoters of this line and the first subscribers were G. H. Wilkinson, H. Stobart, Thos. Wilkinson, William Feetham, Joshua Dickinson, L. Hall, Peter Johnson, Henry Birkbeck, Thos. Richardson, and Simon Martin.

The Weardale or Wear Valley line was still further extended by an Act which received the Royal Assent on the 31st July 1845, and authorised the continuation of the line to Frosterley, with a branch terminating at or

near Bishopley Crag, at Stanhope in Weardale. The subscribers incorporated under this Act were George Hutton Wilkinson, Thos. Meynell, jun., Thos. Richardson, Joseph Pease, jun., Henry Stobart, J. C. Hopkins, Henry Pease, and John Dolphin. This line touched the extreme boundary of the South Durham coal-field, and was mainly designed for the purpose of facilitating the development of the lead mines and limestone quarries in the Valley of the Wear. The authorised capital for its construction was £82,000, divided into 1640 shares of £50 each.

On the 22d July 1847, another Act received Parliamentary sanction "for enabling the Wear Valley Railway Company to purchase or lease the Bishop Auckland and Weardale Railway, the Wear and Derwent Railway, the Weardale Extension Railway, and to raise an additional sum of money." The Bill authorising the extension of the Wear Valley line from Frosterley to Newlandside, near Stanhope, received the Royal Assent on the 28th June 1861. The subscribers incorporated were Henry Pease, Peregrine George Ellison, Archibald Gilchrist Potter, the Rev. H. Ellison, J. Anthony Woods, H. W. Fenwick, Alfred Kitching, R. Thomas, and R. Harvey. The share capital was £10,000. In the following year, another Act was obtained authorising the deviation of this branch and the raising of additional capital.

There is a somewhat lengthy but very interesting history attached to the railway from Darlington to Barnard Castle. So far back as 1832 a meeting of the inhabitants of Barnard Castle favourable to railway extension was held in the Rose and Crown Inn. It was then and there determined that a railway was desirable between Barnard Castle and Darlington, and that the best route would be

by way of Barford to Westholme, and then *via* Hilton, to join the Stockton and Darlington at West Auckland. At the same time it was resolved,—“That a deputation be sent to Darlington to communicate with Mr Joseph Pease, jun., and the directors of the Stockton and Darlington Railway Company, to ascertain whether the company will assist in the formation of such branch, and to obtain from the directors, or any other person, all the information they can as to the practicability of the undertaking, and the prospect there is of its remunerating the shareholders, supposing it to be carried into effect.” It was also agreed that Mr R. Taylor, Mr J. Atkinson, Mr T. Richardson, Mr Ramshaw, and any other gentlemen who thought fit might form a deputation. Mr Richardson undertook the duties of secretary.

The deputation proceeded to Darlington, according to their instructions, and had an interview on the 30th November 1832 with Mr Edward Pease and his sons John and Joseph. Mr Joseph Pease undertook the duty of spokesman, and informed the deputation that he could not hold out any hope of pecuniary aid from the Stockton and Darlington Company, as the shareholders were a very timid body. When the deputation named the route by way of Westholme and Hilton, Mr Pease warned them that the Duke of Cleveland would be sure to oppose it, and that they should avoid a Parliamentary contest. He went into a calculation, however, with the view of ascertaining the cost of a line from Barnard Castle to join the Hagger Leases branch of the Stockton and Darlington Railway, a distance of $7\frac{1}{2}$ miles. That undertaking he calculated at about £50,000, inclusive of two inclined planes and stationary engines. On Mr Pease's recommendation, Mr Storey, the

then engineer to the company, made a survey of the country, and concluded that the Westholme and Hilton was a better route than that *vid* Hagger Leases.

Lack of pecuniary resources caused the project to slumber for some years; nor was it revived again until the 7th of November 1839, when another meeting was held at Barnard Castle, under the presidency of Mr H. T. M. Witham, of Lartington. Resolutions were again adopted in favour of railway communication, and requesting Mr Witham, on behalf of the inhabitants, to wait upon the Duke of Cleveland and ask for his assent to the proposed new line. Mr Witham saw his Grace, but could not obtain from him anything other than a point-blank refusal to sanction the undertaking. He was, in fact, as obstinately opposed to the railway system in 1839 as he had been in 1818, when, as Earl of Darlington, he succeeded in upsetting the first Bill of the Stockton and Darlington Company because it passed through one of his fox-covers.

The death of the Duke in 1842, and the consequent accession to the title and estates of his eldest son, Henry, the second Duke of Cleveland, induced the inhabitants of Barnard Castle to revive their project for acquiring the facilities of which, up to this time, they had been deprived. In 1844, therefore, another meeting was held, whereat Mr J. C. Monkhouse, carpet manufacturer in Barnard Castle, was asked to write and ascertain if his Grace would receive a deputation on the subject of providing railway facilities for the district. His Grace fixed the 17th of October for the proposed interview, and the promoters meanwhile secured the yeoman service of Joseph Pease, with whom attended John Castell Hopkins. Mr Monkhouse explained the object of the deputation, and gave utterance to the wish

of the inhabitants of Barnard Castle for a railway to that town. Mr Pease was then called upon, and urged the advantages of railways and their aid to the promotion of trade and commerce. The seed thus sown fell upon stony ground, his Grace still withholding his countenance from the scheme.*

Various other plans were afterwards proposed, but it was not until the 3d of July 1854 that an Act was passed for the construction of a railway between Darlington and Barnard Castle. The original shareholders were Messrs Thomas Witham, Lartington Hall; Joseph Pease, Southend, Darlington; Henry Pease of Pierremont; J. W. Pease; Owen Longstaff, Barnard Castle; Alfred Kitching of Darlington; J. C. Monkhouse, Barnard Castle; Robert Thompson, Darlington; Richard Dunn, Barnard Castle; Thomas Macnay, Darlington; Isaac C. Cust, Barnard Castle; J. H. Bowman, Darlington; John Steel, Barnard Castle; John Bucton, Darlington; J. D. Holmes, Barnard Castle; W. Thompson, Darlington; and J. Dixon, Barnard Castle. The authorised share capital of the undertaking was £100,000, and power was given to the Duke of Cleveland to appoint one of the directors for life. This line was opened on the 8th July 1856, with suitable rejoicing; it has always, however, been one of the least remunerative branches of the Stockton and Darlington Railway. It traverses a district which is almost exclusively pastoral, and the town of Barnard Castle itself has had an almost stationary population for many years.

With a view to commanding a trade with the west coast, and opening up another route to the markets north and south, *viâ* the Lancaster and Carlisle Railway, a new line

* See Appendix IV.

was shortly afterwards projected from the Hagger Leases branch of the Stockton and Darlington Railway, near the Lands Colliery, to Tebay Junction, in the county of Westmorland. The share capital authorised to be raised was £400,000, and the first subscribers were John Wakefield, Thomas Witham, Robert Hannay, Matthew Thompson, W. H. Wakefield, H. P. Smith, Henry Pease, J. J. Wilson, John Whitwell, Robert Thompson, Isaac Wilson, W. R. I. Hopkins, James Thompson, Thomas Macnay, and J. H. Stobart. Although the directors of the Stockton and Darlington Railway were not in this project pursuing an aggressive course, yet their plans were met by strong opposition. There had previously been numerous schemes on the carpet for the establishment of a line between the east coast and the west. One plan proposed a line *viâ* Lancaster and Carlisle; another aimed at a railway *viâ* York and Carlisle. When the directors of the Stockton and Darlington Railway took the matter up, they were met by a deputation from Westmorland, who offered to bear part of the expense, provided the company carried the proposed line from Barnard Castle *viâ* Brough to Penrith. But this route was strongly opposed by Mr Henry Pease and others, who urged that the line *viâ* Kirby-Stephen to Tebay was the better of the two, and that if this line were constructed a traffic from north-east to south-west might safely be depended upon. The result has more than justified this conviction. On the completion of the direct line from Darlington to Barnard Castle, all passenger traffic intended for the South Durham and Lancashire Union Railway took that route, and the line between Hagger Leases and Barnard Castle was used for mineral traffic only. This line has for a number of years been the principal route between the

east coast and the west, and there is an enormous amount of mineral traffic now passing over it—not less than 15,000 to 16,000 tons of coal and coke per week being regularly sent from South Durham *via* Tebay for the iron trade of Lancashire and Cumberland.

The only other line promoted by the Stockton and Darlington Railway Company to which it is necessary to call attention was constructed under an Act passed on the 21st May 1858, “to authorise the making of a railway from the Lancaster and Carlisle Railway at or near Clifton, to the South Durham and Lancaster Union Railway at or near Kirby-Stephen, all in the county of Westmorland.” Of this line the first subscribers were Sir Richard Tufton, Bart., Rear-Admiral Russell Elliott, Henry Pease, Wm. Crackanthorpe, Wm. Hopes, John Crosby, Isaac Wilson, Robert Addison, Wm. Brougham, Jas. Atkinson, John Whitwell, and W. R. I. Hopkins. The share capital of the undertaking was £135,000, divided into 5400 shares of £25 each. On the 7th July 1862, another Act was obtained to enable the Eden Valley Railway Company to extend their line from Wetherigs Pottery, in the parish of Clifton, Westmorland, to the main line of the Lancaster and Carlisle Railway, “at about forty yards southwards of the bridge in the said parish of Clifton, for carrying Eamont Bridge and Heron Syke turnpike road over the Lancaster and Carlisle Railway.” The Eden Valley line has formed another important connecting link between the great systems of the North-Eastern and the London and North-Western Railways.

The following tabulated statement will be found to furnish in a compendious form the different lines forming the system of the Stockton and Darlington Railway, with

the dates at which Parliamentary consent was accorded to each:—

NAME OF LINE.	ROYAL ASSENT.
Original Stockton and Darlington Railway, .	19th April 1821.
Croft Branch of the Stockton and Darlington Railway,	23d May 1823.
Hagger Leases Line,	17th May 1824.
Line from Stockton to Middlesbrough, . .	23d May 1828.
Bishop Auckland and Weardale Line, . .	15th July 1837.
Wear Valley Line,	31st July 1845.
Wear Valley Extension,	22d July 1847.
Middlesbrough and Redcar Line,	21st July 1845.
Stockton and Darlington Consolidation, .	13th July 1839.
Middlesbrough and Guisbrough,	17th June 1852.
Darlington and Barnard Castle,	3d July 1854.
South Durham and Lancashire Union, . .	13th July 1857.
Eden Valley,	21st May 1858.
Stockton, Darlington, and Lancashire Union Extension,	1st August 1859.
"The Stockton and Darlington Railway Act 1854,"	3d July 1854.
"The Stockton and Darlington Railway Act 1855,"	16th July 1855.
Line from Frosterley to Stanhope,	28th June 1861.
Frosterley and Stanhope Deviation Line, .	3d June 1862.
Eden Valley Extension,	7th June 1862.

CHAPTER XVI.

CALCULATIONS AND RESULTS.

WHILE arrangements were still pending for the projection of the Stockton and Darlington Railway, estimates of a very modest kind were framed as to the probable mineral traffic which it would command. The committee appointed at the Darlington meeting of 1818 to consider the proposed plan for the construction of a railway, reported that coals could not be shipped on the Tees on so low terms as on the Tyne and Wear, and that no increase of revenue could consequently be expected from exportation. The bulk of the income of the new line was to be derived from home consumption. This they estimated at 40,794 tons for Darlington, 13,000 tons for Yarm, and 29,000 tons for Stockton, making a total of 82,794 tons. Out of the 29,000 tons allowed to Stockton, it was expected that 14,500 tons would go into Cleveland.

On hearing this report, it might be supposed that the promoters would hardly care to proceed with their intended venture. Further and more careful calculations were, however, gone into, and these showed the estimated revenue from the new-line to be as follows:—

Coals, 165,488 tons per annum,	.	£11,904	19	0
Lime, 2000 tons	do.	.	104	3 0
Merchandise, &c.,	do.	.	4000	0 0
				<hr/>
Total,	.	£16,009	2	0

The result showed that this latter calculation was not far wide of the mark.

The following statement of the tonnage of coals passing over the line, and the total receipts from all sources for the month of December 1825—the third month of the line being in operation—was compiled by Mr Edward Pease, from whose original calculations it is taken :—

		Tons.		
Etherley coals,	.	1503½	.	£332 9 9½
West Auckland,	.	1061½	.	191 6 6
Witton Park,	.	1060	.	234 11 8½
Eldon,	.	305½	.	41 6 7½
Black Boy,	.	108	.	13 14 8½
Lime,	.	85½	.	10 7 2
Depôt rent for three months,	.		.	24 0 0
Coach,	.		.	14 5 0
				<hr/>
Total amount received,	.		.	£862 1 6

The revenue for the company's second financial year, ending 30th June 1827, was as follows :—

Coals,	.	.	.	£14,455	5	2
Lime,	.	.	.	1026	16	10
Merchandise,	.	.	.	1240	4	1
Passengers,	.	.	.	563	14	9
Sundries,	.	.	.	1018	3	6
						<hr/>
Total,	.		.	£18,304	4	4

We are fortunately able, from an examination of the records of the company, to furnish a complete statement

of the coal traffic for the first eight years. It was as follows :—

Year.	Total quantity of coal ex- ported. Tons.	Total quantity of coal passing over the line. Tons.	Receipts from coal traffic.
1825-26	7295 $\frac{3}{4}$	41,983	£7,984 16 11
1826-27	18,588 $\frac{3}{4}$	80,446	14,455 5 2
1827-28	54,290	111,289 $\frac{1}{2}$	19,373 18 8
1828-29	46,216	110,037 $\frac{1}{4}$	17,614 6 7
1829-30	79,433 $\frac{3}{4}$	147,570	20,951 6 11
1830-31	151,262 $\frac{1}{2}$	229,486 $\frac{1}{2}$	31,840 4 0
1831-32	281,959 $\frac{3}{4}$	366,685 $\frac{3}{4}$	53,053 8 11
1832-33	336,060	424,274	57,819 8 4

For the same period the receipts from coaching traffic, and the total annual revenue, were respectively as follows :—

Year.	Coaches.	Total annual revenue.
1825-26	£233 9 5	£9194 1 9
1826-27	563 14 9	18,304 4 4
1827-28	576 18 6	23,176 4 5
1828-29	545 7 9	20,772 4 10
1829-30	413 6 9	23,727 9 11
1830-31	390 8 0	35,104 12 1
1831-32	464 12 7	57,140 9 0
1832-33	611 6 0	62,150 16 1

The traffic other than coal and passengers chiefly consisted of lime, stones, lead, timber, iron, and merchandise.

At this time the North of England iron trade was little more than a name. In 1823, the total make of pig-iron in Northumberland and Durham was only 2379 tons, and in 1830 it had increased to 5327 tons ;* while in the North Riding of Yorkshire there were no ironworks at all—the

* Finch's Comparative Statement, 1831-32, made by order of the Government.

great district now forming the centre of the Cleveland iron trade being of a purely pastoral character.

The opening of the Stockton and Darlington Railway exercised an immediate influence on the shipments of the Tees ports. From 1821 to 1830 only 110,211 tons of coal were shipped from the port of Stockton. In the next decennial period, however, the shipments increased to 8,293,984 tons, and between 1841 and 1850 they had still further advanced to 11,019,714 tons. It is true that in the next decade the exports of coal from Stockton showed a great falling off, equal to nearly eight million tons; but this was mainly attributable to the fact that coal destined for the London market was sent by railway, direct communication by rail having meanwhile been established with the metropolis. It may be added that Stockton's prestige as a port for the shipment of coals never did stand very high, and it has recently been reduced almost to zero. We find from the elaborate and carefully-authenticated tables furnished to the commissioners appointed by Parliament to inquire into the extent and duration of our coal supplies, that whereas the shipments of coal from Stockton between 1851 and 1860, both inclusive, reached 3,281,307 tons, they had in the succeeding nine years fallen off to the miserably small total of 17,669 tons.

But while the coal export trade of Stockton has declined (chiefly for want of adequate shipping facilities), the trade of every other port on the north-east coast has been largely stimulated by the growth of the railway system. The shipments of coal from the Hartlepoons did not exceed 884,408 tons in 1845; a gradual increase took place between that year and 1850, when the aggregate shipments rose to 1,562,400 tons; and in the decennial period between

1850 and 1860, the total coal export trade of Hartlepool reached 17,315,773 tons.*

Mention has already been made of the fact that the revenue of the Stockton and Darlington Railway Company during their second financial year was only £18,304, 4s. 4d. With this result, which exceeded the estimates made previous to the opening of the line by about £2000, the proprietors were abundantly satisfied. But they were scarcely prepared for the extraordinary accretion of trade and revenue that was so soon to follow. A rapidly extended and extending trade continued to grow up under the company's jurisdiction, until the quantity of traffic carried in 1860 was as follows :—

Coal and coke,	2,045,596 tons.
Ironstone and other minerals,	1,484,409 „
Merchandise,	587,765 „
Number of passengers carried,	687,728

For the same year the revenue reached the colossal sum of £389,252, 11s. 7d., distributed in the annexed proportions :—

Minerals,	£280,375	4	0
Merchandise,	63,478	19	2
Passengers, mails, parcels, &c.,	45,398	7	5
	<hr/>		
	£389,252	11	7

Notwithstanding the almost proverbial dryness of figures, the statistics of the mineral traffic on the Stockton and Darlington Railway are so very remarkable that their further analysis cannot be unprofitable. From 1,380,344 tons of minerals carried over that line in 1850, the coal-traffic rose, as we have seen, to 2,045,596 tons in 1860. Within

* Appendix to Report of Committee, E, p. 84.

this decennial period, therefore, there was a total increase of 665,252 tons. But in 1870 the coal carried over the section had still further advanced to 4,341,631 tons, or an aggregate increase over 1850 of 2,961,287 tons. The increase of revenue is equally without precedent. In 1850, it only amounted to £169,608; in 1860, it had taken a leap to £389,352. We cannot give the revenue at the end of the next decennial period, because in 1863 the Stockton and Darlington Railway ceased to be an independent concern, and its traffic and revenue returns thenceforward became merged in those of the North-Eastern. But we find that in that year the total revenue of the company was £494,690, and in 1867—the last year for which the figures relating to the Darlington section have been extracted—it had taken another bound to £758,815, or very nearly double what it was seven years previously!

This extraordinary augmentation of revenue is due almost solely to the rapid development of the iron trade of Cleveland. That development, as we have already shown, commenced in 1850, and in the following year 181,909 tons of ironstone were carried over the Stockton and Darlington Railway. In 1855, the ironstone traffic had increased to 533,910 tons; in 1860 it was 1,108,636 tons; in 1865 it was 1,529,806 tons; and in 1868 it was 2,153,066 tons. The total quantity of ironstone raised in Cleveland last year (1874) is estimated at about six million tons, and of this enormous product more than four million tons passed over the Stockton and Darlington section!

If we consider the increase in the limestone traffic, the results are, in their way, almost equally startling.

The carboniferous limestone in the valley of the Wear, and more particularly in the neighbourhood of Stanhope and Frosterley, is admirably adapted for fluxing the ironstone of Cleveland in the blast furnace; and about half a ton of limestone is used for every ton of pig-iron manufactured. But when the Stockton and Darlington line was inaugurated, there was no demand for limestone for metallurgical purposes, and we have already seen that while George Overton, in making his survey for the original line, saw the possibility of a good trade being done in the lime and limestone of Weardale, it was only in relation to the demands of agriculture. The limestone traffic of Weardale has all along kept up a ratio of progress corresponding to the growth of the Cleveland iron trade. In 1850 the extent of that traffic was only 66,706 tons. But during the first five years of the Cleveland iron trade it had advanced to 249,000 tons. Five years later it was 310,706 tons. In 1865 it was 492,760 tons; in 1868 it was 514,895 tons; and at the present time it is estimated at little short of a million tons per annum. Up to 1850, the only ironworks supplied with limestone from Weardale were those of the Derwent Company and Bolckow & Vaughan at Witton Park, embracing altogether not more than a dozen blast-furnaces. But there are now nearly thirty different works, scattered over all parts of Cleveland and South Durham, and embracing an aggregate of about *a hundred and fifty blast-furnaces*, that mainly depend upon the quarries of Weardale for their supplies of limestone. It is not irrelevant to the scope of these remarks to add, that for a number of years the Stanhope limestone quarries

in Weardale were carried on by the Stockton and Darlington Railway Company, who acquired them from the old Derwent Iron Company—now merged in the more prosperous Consett Company—and, as private traders, took every means to promote their development.

In 1861, it was calculated by the late secretary of the company, Mr Thomas Macnay, that the length of line actually opened for traffic was 125 miles; that the extensions then in course of formation would represent an additional 75 miles—making a total of 200 miles of railway; and that the amount expended up to that time on the various works undertaken by the company—including the dock at Middlesbrough and the supply of rolling stock—would represent a total of not less than £3,800,000 sterling!

At the present time, the total length of railway belonging to the Stockton and Darlington system is more than 220 miles, and the total amount expended on works and rolling stock is not less than six millions sterling!

The dividends declared to the proprietors of the Stockton and Darlington Railway Company during the first five years after the line was opened were a little short of five per cent., so that the anticipations of Mr Edward Pease were all but realised. During the five years ending 1860, the dividends averaged nine per cent. per annum; and from that date the receipts have gone to swell the dividends of the North-Eastern. It is no secret that it is due to their acquisition of the Stockton and Darlington section that the North-Eastern Railway Company have been able, since 1862, to declare such high dividends. Many of the branches that now form part of that huge system are totally unremunerative; some

are an absolute source of loss. What the dividends of the North-Eastern Railway Company would have been during the last ten years without the aid of the Darlington section, we shall not venture to conjecture; but it may at least be remarked, with all safety, that the amalgamation of the two companies, whether beneficial or otherwise to the original railway, was decidedly advantageous to the North-Eastern.

About the future—what will it be? To what extent will it correspond with the past? How far will the inexhaustible mineral treasures of the district traversed by the Stockton and Darlington line promote the population and wealth of the North of England? What rank will this district yet take among the industrial and commercial centres of Christendom before the inevitable New Zealander contemplates the ruined memorials of its greatness? Within fifty years the mineral traffic of South Durham has advanced from less than a million tons to nearly eighteen million tons per annum. Within twenty years it has more than doubled. If it should even exhibit during the next half century a diminishing ratio of increase, the population and industrial importance of the district will have taken a tremendous leap.

The commissioners appointed to inquire into the probable extent and duration of our coal supplies have calculated, on the basis of diminishing ratios, that within a hundred years from the present time, our home consumption of coal will reach the gigantic total of 274,000,000 tons, or considerably more than double our total output of coal in 1874; and if our export trade is increased in the same ratio, the production of coal in the United Kingdom will be nearly four times greater in 1974 than it was last

year. South Durham now produces nearly a sixth of all the coal raised in the United Kingdom. It is the most productive of all our coal-fields, and the most susceptible of further development. Nay, more, it is far and away the most productive coal-field in the world. It yields an annual output of coal equal to nearly one half the total production of the United States, which was calculated in 1872 at 41,491,135 tons. It can claim an annual output of nearly five million tons more than the whole of Belgium, and its production is larger than that of any other European country. If it only doubles that production in the next fifty years, its coal trade alone will be equal to affording employment to about *a hundred thousand* hands; or, to put it in another way, its production of coal in 1925 should be more than one half of the whole output of the United Kingdom in 1859! As for the iron trade of Cleveland, it has already, within twenty-five years, attained more than double the dimensions of the whole iron trade of the United Kingdom in 1835, and is now about a million tons less than the total make of pig-iron in the United Kingdom in 1854! * In comparing this district with others abroad, it will appear that nowhere has metallurgical progress been so rapid and remarkable. America alone can furnish a parallel. In that country the total quantity of pig-iron made in 1871 was only 1,912,608 tons, being less than the aggregate production of pig-iron in Cleveland in 1874; but in 1874 the pig-iron production of the United States reached 2,689,413 tons, or, in round numbers, about 688,000 tons more than the make of pig-iron in Cleveland during 1874! † In the iron trade of Cleveland, as in the

* The total quantity of pig-iron made in the Cleveland district in 1874 was 2,001,233 tons. In 1854 the United Kingdom produced 3,069,838 tons.

†, Bulletin of the American Iron and Steel Association.

coal trade of South Durham, there is unlimited scope for development ; and it is not transgressing the limits of probability to assume, that in the next quarter of a century it may be nearly if not more than double what it is at the present time !

CHAPTER XVII.

THE NORTH-EASTERN—PAST AND PRESENT.

IT is hardly necessary to state that the Stockton and Darlington Railway was at once the parent and the nucleus of the North-Eastern, with which it is now incorporated. The title of North-Eastern was bestowed in 1852 on a congeries of independent lines, including the York, Newcastle, and Berwick, the York and North-Midland, and the Leeds Northern Railways. For a number of years subsequent to its completion, the Stockton and Darlington Railway stood alone among the public passenger-carrying railways of the North. But numerous projects had in the meantime been mooted for an extension of the system, and especially for the establishment of through communication with the metropolis. So far back as 1823, a pamphlet, published anonymously, appeared in London, recommending the construction of a railway from that city to Edinburgh, with branches to all the principal towns. A scheme was under gestation at York in November 1825, for making a railway from Selby *via* York to Newcastle and Sunderland. This line was to shorten the distance by twelve miles between the limits of north and south, and to carry goods at 3d. per ton per mile, at a rate of six miles per hour. In December 1826, there was another proposal made at York for the continuation of the Stockton and Darlington Railway

from Croft Bridge—then the southernmost limits of authorised railways north of Manchester—and the city of York. It was not, however, until 1836 that this proposal assumed a tangible shape. In that year an Act was passed for the incorporation of the Great North of England Railway Company. The promoters proposed the construction of a through line from Newcastle to York, with a branch from Woodend, near Thirsk, to Leeds. Their Act enabled them to construct first the portion lying between Croft and Newcastle; and that was surveyed by Mr Thomas Storey, engineer to the Stockton and Darlington Railway, for this purpose. The line passed close to Durham city on the east, thence to the west of Chester-le-Street, and thence, *via* the Team Valley, to Newcastle. Circumstances, however, interposed to prevent the fulfilment of this purpose, and the line from Darlington to York was first undertaken after all. The opening of this road for passenger traffic took place in 1841, the distance of $44\frac{1}{2}$ miles being accomplished in little more than three hours, inclusive of numerous stoppages. After the opening of this line, a handbill was issued, announcing “Railway communication between London, Darlington, and Newcastle.” It informed the public that “on and after Thursday, the 5th of May next, an expeditious, commodious, and economical communication will be opened from the Great North of England Railway Station at Darlington to Durham, Shields, Sunderland, and Newcastle. The route will be by the Stockton and Darlington Railway to South Church, near Bishop Auckland, thence by well-appointed omnibuses, and the Durham Junction and Brudling Junction Railways, in connection with the trains to and from Dinsdale Baths, Yarm, Stockton, and Middlesbrough.

The trains will start from each end four times a day, and the distance will be performed in about three hours and a quarter."

Limited pecuniary resources compelled the Great North of England Railway Company, after the completion of the line from Darlington to York, to abandon the projected extension from the former town to Newcastle. This, however, was an absolutely essential link in the great through chain of communication between north and south, and it could not long remain incomplete. Hence a company was shortly afterwards formed—with the name of the Newcastle and Darlington Junction Railway—who undertook the connection of the Tyne ports with the south; and the Team Valley line of communication between Darlington and Newcastle was opened in 1844, when a train, for the first time in the history of the railway system, accomplished the through journey from London to Gateshead, a distance of 275 miles, in nine hours, Mr Stephenson, Mr George Hudson—to whose exertions the construction of this line was mainly due—and other prominent men in the railway world having "assisted" at this great event. It may be noted here that the two Stephensons not only constructed the last-mentioned line, but they had the satisfaction of having constructed lines of railway extending from London to Liverpool on the west; from Liverpool and Manchester to Leeds and York on the east; from Rugby to York; and thus (with the exception of the forty-five miles from York to Darlington, for which Mr Storey was the engineer) the whole system between London and their native Tyneside.

Cognate to the opening of the York and Darlington Railway, it may not be uninteresting to put on record an

achievement in railway travelling that was regarded at the time with wonder. A great controversy was pending in the country, that has found a place in history as "the battle of the gauges." The subject was deemed of such great practical importance that a commission was appointed by the Government in 1845 to inquire into and report upon it. George Stephenson and Nicholas Wood were examined before that commission in favour of the narrow gauge interest, of which Stephenson was the redoubtable champion. With a view to showing the adaptability of railways to convey passengers safely on the narrow gauge lines at a high rate of speed, Mr Wood obtained from the then Newcastle and Darlington Railway Company permission to try the speed of travelling from Darlington to York with one of their best engines. The result repaid Mr Wood for his temerity. He performed the journey of forty-five miles in forty-four minutes, and thus eclipsed all former achievements of the locomotive. The train consisted of two first-class carriages, the driver, the stoker, and Mr Wood, who had the satisfaction shortly afterwards of finding that the narrow gauge system, to which he had pinned his faith, was recommended in preference to the broad gauge for British railways. Between four miles an hour and fifty there was certainly a great gulf fixed, but the experience of twenty years, allied to engineering skill and boldness, had bridged it over.

The Newcastle and Darlington Junction Railway Company having acquired the various lines belonging to the Great North of England Railway Company, assumed the title of the York and Newcastle Railway Company, and afterwards that of the York, Newcastle, and Berwick Railway Company. In 1852, as already indicated, these united

lines, with the addition of the York and North Midland, and the Leeds Northern Railways, assumed the wider and more comprehensive name of the North-Eastern Railway Company. It will now be our endeavour to follow the growth and exhibit the magnitude of the great system which has directly sprung from the original Stockton and Darlington Railway, and with which that line is now incorporated.*

At the end of 1857, the total amount of share capital authorised to the North-Eastern Company was £16,521,515, of which £14,779,818 had been called up and paid. The debenture debt was £6,948,380. In 1860 the share capital was £17,153,905, of which £15,662,397 had been received. The debenture debt was £7,250,840. In 1864 the share capital was £24,312,800, and the amount received was £22,487,137. The debenture debt was £8,625,733. In 1867 these figures had been raised to £29,199,276, to £27,841,607, and to £10,445,704 respectively. In 1870 the figures were £34,613,588 (of which £30,135,500 had been received), and loans and debentures £10,540,146. The total capital, subscribed and authorised, is now upwards of fifty-five millions sterling, forty-two millions by shares and stock, and nearly fourteen millions by loans and debenture stock!

The mineral traffic of the company exhibits a more extraordinary increase than any other. In 1857 the total half-yearly revenue from this source was only £266,606. Seven years later it had advanced to £544,765. In 1870 it was £840,238; and for the half year ending 30th June 1875, it was £1,251,711.

Nor is the increase in the number of passengers carried by

* See Appendix VII.

the company less remarkable, having advanced from three millions for the first half of 1853, to eleven and a half millions for the last half of 1874. The total number of passengers carried by the company in 1874 was 28,727,162, exclusive of 13,117 season-ticket holders.

The working expenses of the company have risen from £340,860 in the first half of 1853, to £1,662,179 for the second half of 1874.

In the number of train-miles run there has been a rate of progression that fully corresponds with the remarkable development indicated by these figures. In the first half of 1853 the number of train-miles run was 3,917,858. In the first half of 1875, or within a period of only twenty-two years, the number of train-miles run was 10,632,678, and as the latter figures are an increase of 528,946 miles on the corresponding half of 1874, they may be accepted as one of the most obvious and convincing proofs it would be possible to afford respecting the continued prosperity of the company.

The Stockton and Darlington Railway was commenced with two locomotives and two or three score of wagons. There are now about two hundred and fifty locomotives, and more than 12,000 wagons employed on the Darlington section alone! On the whole North-Eastern system the number of engines has advanced from 414 in 1857 to 1226 in 1875. Coaching stock has progressed from 1003 in the former year to 2232 in the latter. In merchandise wagons there has been an advance from 5609 in 1857 to 26,174 in 1875; and of mineral wagons the company now own about 50,000, as compared with only 15,572 in 1857.

During the second half of 1874, the North-Eastern Rail-

way Company spent in the repair and renewal of wagons alone, about £40,000 more than the whole cost of the original Stockton and Darlington Railway!

The latter line, again, had a total length of only twenty-five miles, there being a single line of rails for the whole of that distance. The North-Eastern Railway Company has now 1400 miles opened for traffic, of which about 900 miles are laid with a double line of rails.

The total revenue of the Stockton and Darlington Railway for the financial year ending 30th June 1827 was £18,304. The gross receipts of the North-Eastern Railway for the *half year* ending the 30th June 1875 was £3,200,702, the total annual revenue of the company being now nearly *six and a half millions sterling*!

Examined by themselves, these figures are perhaps sufficiently startling, but their meaning and extent may be better understood by comparing the position of the North-Eastern with that of the three other great railway companies in the United Kingdom. The London and North-Western Railway had 1600 miles open at the end of 1874, or 214 miles more than the North-Eastern; and the total number of passengers carried in that year by the former company was 447,138,530, as compared with only 28,727,162 carried by the latter. The revenue from all sources of the London and North-Western Railway Company in 1874 was £9,005,385, of which only £1,761,882 was derived from minerals; but to the total revenue of £6,370,252 earned by the North-Eastern in the same year, minerals contributed £2,318,101.

Let us now take the Midland Railway, which is the great rival—so far as it has any rival at all—of the North-Eastern over its southernmost limits. The Midland Company at the

end of 1874 had 1114 miles opened for traffic, or 272 miles less than the North-Eastern. The number of passengers travelling on the former railway in 1874 was two and a quarter millions less than on the latter. The total receipts from all sources of the Midland Company reached £5,811,236 in 1874, as compared with £6,370,252 earned by the North-Eastern ; and the mineral receipts of the former company only reached £1,598,758, as compared with £2,318,101 accruing to the North-Eastern. The authorised capital of the Midland Company is about three millions sterling under that of the North-Eastern.

So far as the Great Western—the second largest system in the kingdom—is concerned, we find that although its mileage is, roughly speaking, a hundred and fifty miles more than that of the North-Eastern, its total receipts from all sources is nearly a million less ; its total receipts from goods traffic is less by a million and a half sterling, and the number of train-miles travelled in 1874 is less by more than a million and a half. The total authorised capital of the Great Western is more than a million under that of the North-Eastern.

The North-Eastern Railway differs from nearly all the other leading railways in Great Britain in respect of the fact that practically the whole system is a gigantic monopoly. It does not divide the traffic of the district which it serves with any other railway. It is not only the possessor of large locomotive works at Gateshead, Darlington, and elsewhere, but it owns an extensive system of docks at Hartlepool, Sunderland, Newcastle, Middlesbrough, and other ports along its route. Its minor possessions we cannot stay to catalogue ; but it may be remarked, in conclusion, that every year adds largely to its capital and other

resources; that its directors are ever considering new schemes of aggrandisement, if not of aggression; that it is the property of more than 23,000 shareholders—a notable contrast to the sixty shareholders of the original Stockton and Darlington Railway!—that its traffic is being developed at a rate which no other line, whether at home or abroad, can rival; and that its dividends are seldom under, and often over, eight per cent.!

CHAPTER XVIII.

PROGRESS OF RAILWAYS IN GREAT BRITAIN.

AS England was the home of the railway system, so also is it the country in which that system has attained its highest degree of perfection and development. Figures and facts have already been furnished to show the extent of that development in the case of the North-Eastern Railway. But the wonderful progress indicated by these figures may be said to be only typical, and illustrative of the general growth of railways at home and abroad over the period to which they apply.

Up to and including 1836, no less than thirty-four different Bills for railway projects had received the sanction of Parliament, authorising the formation of 994 miles of railway, at an estimated cost of £17,595,000. In the following year fourteen new companies were incorporated, and authorised to construct 464 miles of railway at a cost of £8,087,000. And, says Smiles,* "as if the extent already authorised was not sufficient to satisfy the rage for railway extension, by the end of 1837, notices were given of seventy-five new Bills, to authorise the construction of 1200 miles of additional railway, at a cost of about

* *Vide* Life of George Stephenson.

£19,000,000, while by that time £30,000,000 had been expended, and nearly 1500 miles constructed ; and it was estimated that the railways in course of construction would cost £22,000,000 before they were ready for traffic."

This mania for railway construction was only of short duration. The inevitable reaction took place, accompanied by a thorough collapse, and during the six years between 1838 and 1844 very few new lines were projected. But in 1844 the mania again broke forth with greater vigour than before, and in November of that year a list of projected lines, involving an aggregate capital of £563,203,000 was published by Mr Spackman. Of course many of these projects were abandoned, some of them being apparently as feasible as the making of a railway to the moon ; but in 1844 and the two following years Parliamentary sanction was obtained to Bills for the construction of 8470 miles of railway. This was just about treble the mileage then constructed ; and as the capital required for the carrying out of the authorised extensions was £180,138,901, there was another panic, which again checked for a considerable time the further growth of the railway system.

It was calculated by Mr Robert Stephenson* that at the end of 1854 the total length of the lines authorised by Parliament was 13,983 miles ; but as 1177 miles had been abandoned, and there still remained about 4752 miles to be constructed, the aggregate length of the railways opened in Great Britain and Ireland at that time measured about 8054 miles—a length equivalent to the diameter of the globe, and nearly 500 miles more than the united

* Proceedings of Civil Engineers for 1856.

lengths of the Thames, the Seine, the Rhone, the Ebro, the Tagus, the Rhine, the Elbe, the Vistula, the Dnieper, and the Danube, or the ten chief rivers of Europe.

The amount of money which Parliament had authorised to be raised for railway works at the end of 1854 was £368,000,000. Of that amount no less than £286,000,000, or a sum more than four times the annual value of all the real property of Great Britain, and more than one-third of the National Debt, was actually raised.

In the same year 111,206,000 passengers were carried by rail, and the aggregate receipts from this source amounted to £9,174,000; while the total receipts from all sources reached the sum of £20,215,000.

Between its inauguration in 1825 and the year 1844, the railway system had extended so rapidly that in the latter year Parliament passed an Act which provided that in twenty-one years it should be competent for the Government, at its option, to purchase or assume the management of all existing railways. The purpose of this Act was the prevention of the possible evils that were feared from the power of the railway monopoly; and when the Act was being passed, Mr Gladstone, as a member of the Government, calculated that the total receipts of the railways then opened—amounting in 1844 to about five millions sterling—might in fifteen years reach a total sum of fifteen millions. But in less than ten years, as already stated, they had reached upwards of twenty millions sterling, and twelve years later still (in 1866) they reached upwards of thirty-six millions sterling!

The following tabulated statement, compiled from the Board of Trade returns, exhibits, in a compendious

form, the growth of the British Railway system from 1849 to 1874, both inclusive :—

YEAR.	Length of Line Open.	Total Capital Authorised.	Total Capital Paid up.	Per Mile of Line open.	Number of Passengers conveyed exclusive of Season-Ticket Holders.
	<i>Miles.</i>	<i>£</i>	<i>£</i>	<i>£</i>	<i>No.</i>
1849	6032	359,065,115	229,747,779	38,088	68,841,539
1850	6621	362,796,676	240,270,746	36,289	72,854,422
1851	6890	367,555,543	248,240,897	36,029	85,374,116
1852	7336	359,725,894	264,165,680	33,283	89,102,765
1853	7686	366,769,733	273,324,516	35,561	102,265,702
1854	8053	368,384,308	286,068,794	35,523	111,180,165
1855	8335	374,971,966	297,584,709	35,703	118,567,170
1856	8710	377,767,907	307,594,086	35,315	129,315,196
1857	9447	387,051,734	315,157,260	33,329	138,971,240
1858	9542	392,682,755	325,375,507	34,099	139,141,135
1859	10,002	383,716,351	334,362,928	33,430	149,757,294
1860	10,433	399,414,827	348,130,127	33,368	163,435,678
1861	10,865	429,872,946	362,327,338	33,349	173,721,139
1862	11,551	450,596,738	385,218,438	33,349	180,429,071
1863	12,322	474,999,545	404,215,802	32,804	204,635,075
1864	12,789	520,522,334	425,719,613	33,288	229,272,165
1865	13,289	576,291,663	455,478,143	34,275	251,862,715
1866	13,854	620,564,406	481,872,184	34,782	274,293,668
1867	14,247	642,853,408	502,262,887	35,113	287,688,113
1868	13,803	615,445,618	511,680,855	37,070	304,136,334
1869	15,145	609,267,653	518,779,761	34,254	305,668,071
1870	15,537	596,178,382	529,908,673	34,106	330,004,398
1871	15,376	615,726,890	552,661,551	35,943	375,220,754
1872	15,814	644,589,353	569,047,346	35,984	422,874,822
1873	16,082	676,686,586	588,320,308	36,574	455,320,188
1874	16,449	704,338,299	609,895,931	37,078	477,840,411

It may not be necessary to supplement the above figures further than to point out that the total receipts of the rail-

ways in the United Kingdom advanced from £11,806,498 in 1849 to £45,078,143 in 1870, and £59,255,715 in 1874; that the net receipts advanced from £14,579,254 in 1860 to £23,362,618 in 1870, and £26,643,003 in 1874; and that the total receipts per mile of line open rose from £1957 in 1849 to £2794 in 1870, and £3459 in 1874.

The increase of profits accruing to the different railway companies in the United Kingdom may be estimated from the fact, that whereas in 1855 the total gross assessment of railways (under Schedule A) was £8,291,162, it had reached in 1872 (under Schedule D) an aggregate sum of £19,791,095, being, within seventeen years, an increase of 138 per cent.*

To multiply figures would be tedious and unprofitable. Enough, and probably more than enough, has been stated to demonstrate that Sir Robert Peel was right when, in 1847, he stated that by the extension of railways the foundations of future prosperity were being laid; and that when Lord George Bentinck subsequently declared in the House of Commons, that "it requires no conjuror to discover that the change which has come over the circumstances of the country arises, not from any political changes in the commercial policy of the country, but from that mighty enterprise (the railway system) which has given employment to so many people," he only recited words which have since found an echo throughout the length and breadth of the land.

* National Finance, by J. Noble. Longmans & Co., 1875.

CHAPTER XVIII.

RAILWAY PROGRESS ABROAD.

IF there is anything in the whole range of statistical history more remarkable than the development of the railway system at home, it may fearlessly be pronounced to be the extension of railways abroad. After England, the first nations in Europe who adopted the railway system, on anything like a large scale, were France and Belgium. A short railway had been constructed so far back as 1832-33 in Bohemia, for the conveyance of salt to the Danube. The promoters of this line sent their engineer over to Darlington to "interview" Edward Pease on the position and prospects of the railway system. Mr Pease, as was his wont when speaking of railways, extolled them in superlative terms, and urged his visitor that they should not only have a railway, as proposed, but also introduce a number of locomotives from England. "That," replied the latter, "would nivvaire do. Ven our people see de wagons on de line, dey vill fall down and cross demselves; but if dey see an iron horse sending out fire and smoke, dey would tink le diable himself had come." This railway, we believe, was worked entirely by horses, mainly to conciliate the superstitions of the natives, for a number of years. It was not until the success of the Stockton and Darlington, and subsequently of the Liverpool and Manchester rail-

ways had been placed beyond all doubt, that railways were undertaken from Paris to St Germain and Versailles. But in 1837, only eighty-five miles had been opened in France, as against nearly 500 miles in England. In 1840, the number of miles opened in France reached 338; in 1845 there were 508 miles; and in 1850 there were 1807 miles. In 1852, the late Emperor of the French took railways by the hand, and "by a system of great wisdom, singularly adapted to the French people, he put an end to the previously feeble management, and launched into a bold course of railway development."* The result was, that between 1850 and 1855 there was an average annual increase of 301 miles; and in the next five years there was an average annual increase of 454 miles. At the end of 1865, however, there were only 8134 miles of railway constructed in France, as compared with 13,289 miles constructed in England. As England had the same railway mileage in 1855 that France had in 1865, the latter country was ten years behind the former in the actual length of railways constructed; and it is interesting to notice, that whereas in 1865, France had only one mile of railway to every 4595 of her population, England had one mile of railway to every 2206 of population.† France is still a long way behind Great Britain in the length of railways open. At the close of March 1873, the total length of railways open in France was 11,162½ miles; and at the close of the same month in the following year, the total length in operation had grown to 11,601 miles, so that 439 miles had been opened during the year. Large additional extensions are now in contemplation, and there is otherwise ample

* Statistical Society's Journal for 1866, p. 569.

† Baxter on Railway Extension and its Results.

evidence to show that France is a long way from the limits of her railway system.

Belgium has in railways, as in nearly every other phase of industrial and commercial progress, approached more nearly to Great Britain than any other European country. So far back as 1833, the Belgian Government resolved to adopt the railway system, and employed George Stephenson to plan railways between all the large towns.* The law authorising the construction of these lines at the expense of the State passed in 1834, and no time was lost in carrying it out. But up to 1839, only 185 miles of road had been opened. In 1845 this was increased to 335 miles, in 1853 to 720 miles, in 1860 to 1037 miles, and in 1864 to 1350 miles. At the present time the total length of railways in operation throughout Belgium is nearly 3000 miles.

In due course Germany, Italy, Holland, Denmark, and Austria came into the field, and last of all Russia and Turkey. The progress of Russian railways within the last few years has been without parallel in Europe. During the year 1873 the total mileage of railways in that country increased from 13,217 to 15,191 versts, being in the ratio of about 15 per cent. ; and at the present time there is perhaps more activity in Russian railway construction than can be found in any other country.

At the end of 1873 the total length of railways in Europe was 63,360 miles. At the same date there were 27,564 miles constructed within the limits of the British Empire, 16,082 of which were in the United Kingdom, 5872 in India, 3899 in Canada, and 1257 in Australia. This total, large though it may appear, is far from equal

* Baxter on Railway Extension and its Results.

to the requirements of Her Majesty's dominions, and last year there were 550 additional miles of line under construction in New Zealand alone, while 360 more miles were authorised. In India, also, a great deal is being done in the way of railway extension. At the end of last year the total length of railway sanctioned for India, including both guaranteed and state lines, was 7799½ miles. Of this mileage, 5872 miles were completed, and 1927 miles remained to be finished.

But in this race Americans are justly entitled to assert their vaunted claim to "lick creation," for there is no more wonderful chapter in the annals of that wonderful country than that which deals with the growth of their railway system. Between 1830 and 1864 the mileage constructed in the United States was as follows:—

Year.	Total Mileage.	Increase per Annum.
1830	41	...
1840	2197	215
1845	4522	465
1850	7475	590
1855	17,398	1984
1860	28,771	2274
1864	33,860	1272

In the latter year America had a total mileage equal to four times that of France, two and a half times that of England, and nearly as large as the total mileage of Europe, including the United Kingdom.

Great as American railway progress was up to 1864, it was nothing to what her development has been since that date. At the end of 1873 there were 70,650 miles of railway actually in operation in the United States, and in that year the increase was nearly 3000 miles. It is impossible to foresee the ultimate limit of American

railway extension. The American railway journals recently expressed a belief that in the year 1880 there will be 100,000 miles of railway in the great Republic. In prosperous years the total extension of railway mileage has reached the enormous total of 13,000 miles—or within 4000 miles of the total length of railroad opened in Britain;—but even taking the increase of 1873 as an average, the one hundred thousand miles would be passed in four years. The same authority remarks, that “should this progress continue, the total mileage in 1884 would be 140,000 miles.”

Space will not allow us to speak at length of what has been done or is now in contemplation elsewhere. The vast Empire of India is yet a very long way from having a complete chain of railway communication—in fact, it may be said that in that country, and in the whole of the Orient, railways are yet in their infancy. Africa has heretofore had but little experience of railway amenities and advantages; but on that great continent, as time rolls on, there must be scope for enormous expansion in this direction, and that expansion will undoubtedly be, as it has been elsewhere, accompanied by a large development of the splendid commercial resources of richly endowed but hitherto inaccessible territories. For want of railways the interior of China has been a *terra incognita* to the rest of the world. John Chinaman finds his migratory steps directed to other lands where superstition is less rife, where caste is less dominant, where the liberty of the subject is less restrained, and he proves the possession of no mean capacity for skill and industry; but that capacity is largely inoperative at home because of the lack of opportunities for its exercise; and those opportunities are

absent mainly because of the prejudices that prevent a more intimate knowledge of, and a stronger reciprocity with, the commercial resources of other nations. But the barriers of isolation and restriction that have so long separated China from the lands of the West are being broken down, and there is now every prospect of railways being introduced and rapidly extended in that vast empire.

CHAPTER XX.

ANTECEDENTS OF THE LOCOMOTIVE ENGINE.

THE North of England has been the birthplace of many mechanical improvements of note. It cannot actually claim the invention of the steam-engine, although it had much to do with bringing that most remarkable of prime movers to its present high condition of efficiency. But it was in the North that Buddle perfected the furnace-ventilation of mines. It was here also that Stephenson invented his safety-lamp. The first coal-cutting machines of which we have any record were brought out in the great Northern coal-field. Sir William Armstrong invented the most valuable arm of defence owned by the country on Tyneside. In the same district Pattinson patented his remarkable process for the desilverisation of lead. At the Elswick Works the improvement of hydraulic machinery has been carried to an acme of perfection entirely unique. Palmer introduced and perfected the screw-collier on Tyneside; and here also it was that rolled armour-plates were first used in the construction of vessels of war. While in these latter days we have witnessed in the Cleveland district the most remarkable advances that have ever been made in the metallurgy of iron—advances that have raised the height of our blast-furnaces within twenty years from 45 to 105 feet, and increased their cubical capacity from 4000 to 55,000 feet; that have reduced the consumption of coke

per ton of iron made from 38 cwt. to 20 cwt.; that have raised the production of our rolling mills from 60 to 1000 tons per week, and assisted materially the perfection of the great art of mechanical puddling; and, finally, advances involving economy of power and resources in every department of metallurgical and mineralogical science.

But all these advances have been overshadowed by that which has marked the career of the locomotive engine. The first locomotive constructed for the Stockton and Darlington Railway Company had only one flue or tube through the boiler. The heated air travelled through this flue direct to the chimney; and so imperfectly was the heat abstracted by the water, that the chimney regularly became red-hot. In succeeding engines the flue or tube traversed the boiler, and then returned back again, thus doubling the heating surface. Some engines of the latter type were working on the Stockton and Darlington line up to the year 1858.

In 1827, Stephenson brought out the "Rocket"—the first engine used on the Liverpool and Manchester Railway—with 25 tubes of copper, each 3 inches diameter. The single flue adopted in the original Stockton and Darlington locomotive was 10 inches diameter, and 10 feet in length, and it exposed to the flame about 26 superficial feet. The 25 tubes of the "Rocket," however, presented an area of heating surface equal to 190 feet. The effect of this great increase in heating surface was not only the attainment of greater speed and power, but a marked economy of fuel. Consequent upon the success which attended the introduction of the multitubular boiler, its principle was not only universally adopted for locomotive purposes, but it was carried much further in succeeding engines, until

upwards of a hundred tubes became established as a general rule.

Simultaneously with the adoption of more tubes of smaller diameter another improvement was introduced. The fire-box was constructed outside so as to give a much larger fire than could possibly be used with the single tube of the earliest engines. The outside fire-box is an improvement ascribed to George Stephenson ; the double or return tube was the idea of Mr Timothy Hackworth ; and "the merit of the first invention of a boiler with tubes," to quote from Robert Stephenson, "is due to a French engineer, M. Leguin," who had a patent for it in 1828, although the application of the principle in the "Rocket" engine was undoubtedly an independent invention.

The cylinders of the original or No. 1 engine—by which term it is usual to speak of the old "Locomotion"—were placed perpendicularly, as they were, also, in many subsequent engines. This arrangement was a very objectionable one, causing an oscillatory or rocking motion. With a view to obviate this disagreeable result, the cylinders were in some succeeding engines—as in the "Prince" and "Driver," which were regularly worked on the Darlington line until a very recent date—placed at an angle, or in a sloping direction. But this principle, although an improvement on the perpendicular cylinder, was found to be attended with several disadvantages ; and it was at length resolved to try the use of horizontal cylinders. These have now come to be universally adopted, being admittedly vastly superior to their crude and imperfect predecessors.

The weight of the original engine was only seven tons. Greater weight gradually came to be adopted for greater loads, until, in 1857, Mr John Dixon, C.E. — the same gentleman that assisted Mr Stephenson in his survey of

the Stockton and Darlington line—mentioned it as an evidence of great progress, that engine No. 105 had a weight of 25 tons; and the Great Northern Railway engines of 34½ tons were, in 1860, looked upon as extraordinary prodigies of weight and power. But the heavy passenger engines made during the last two or three years at the North Road Engine Works in Darlington for the first public railway have attained the almost unprecedented weight of 40 tons! Within fifty years, therefore, there has been a fivefold increase in the weight of the engines employed on the Stockton and Darlington Railway.

This is, undoubtedly, a great and startling advance, but it appears to be dwarfed into utter insignificance when compared with the increase in the rate of speed attained during the same period. The most that No. 1 could achieve on a level was eight miles per hour, and when, in 1830, the "Rocket" engine reached twelve miles an hour on the Manchester and Liverpool Railway, there was a disposition to "rest and be thankful." But improvement rapidly succeeded improvement, until the passenger trains of the North-Eastern Railway had reached, in 1860, a travelling speed of forty-two miles an hour, and about the same time the Great Northern Railway passenger engines were worked up to forty-five miles per hour. It has been established by convincing experiments, that the passenger engines, facetiously spoken of as "Ginx's Babies," now used on the Darlington section of the North-Eastern Railway, can be worked up to a speed of sixty-five to seventy miles an hour!

In all other matters of detail, the size and power of the engines now built are correspondingly greater than in the early locomotives. To speak of these at further length may not be necessary. Enough has been adduced to establish the conclusion set forth in the early part of this

chapter, that the advances made in locomotive engineering during the last fifty years have eclipsed all other mechanical improvements, not only in their extent, but also, and more especially, in their ultimate effects on the advancement of material power, the development of natural or acquired resources, and the promotion of scientific knowledge.

The following table presents in a compendious form the capabilities and dimensions of locomotive engines, past and present :—

	Killingworth Engines, 1825.	Rocket Engine, 1830.	North-Eastern Railway Passenger Engine, 1860.	North-Eastern Railway Passenger Engine, 1875.
	Inches.	Inches.	Inches.	Inches.
Diameter of cylinder, .	9	8	15	17
Length of stroke, .	24	17	22	30
Number of wheels, .	4	4	6	6
Do. coupled, .	4	2	4	4
Diameter of driving- wheels, . . . }	Feet. 4	Feet. 4 $\frac{3}{4}$	Feet. 6	Feet. 7
Evaporating surface (fire-box tubes), . }	Square Ft. 10 $\frac{1}{2}$	Square Ft. 20	Square Ft. 108	Square Ft. ...
Pressure of steam, .	Lbs. 50	Lbs. 50	Lbs. 130	Lbs. 140
Weight of engine, .	Tons. 7 $\frac{1}{2}$	Tons. 4 $\frac{1}{4}$	Tons. 30 $\frac{1}{2}$	Tons. 40
Number of carriages, .	12	12	20	30
Gross load, . . .	Tons. 40	Tons. 40	Tons. 92	Tons. 130
Rate of travelling, .	Miles per hour. 6	Miles per hour. 12	Miles per hour. 42	Miles per hour. 60

No reference is made here to the goods engines, which have been enormously increased in size and power during the last few years, and more particularly so on the Stockton and Darlington line, where the heavy mineral traffic necessitates the regular drawing of heavy loads. The goods engines now usually made at the Darlington locomotive works are twenty-six feet long, thirty-five tons weight, seventeen inches diameter of cylinder, twenty-six inches stroke of piston, have six coupled driving-wheels, each five feet diameter, and are capable of drawing a load of nearly 675 tons.

CHAPTER XXI.

GENERAL CONCLUSIONS AND RESULTS.

FIGURES have been already heaped upon figures, and calculations upon calculations, to such an extent, that we can hardly claim any degree of consideration for troubling the reader with more. Nevertheless, there are certain not unimportant phases of railway progress that have not yet been referred to even in the most casual way; and much remains to be told before even the broadest and most obvious results of that progress have been adequately expounded.

Among the more remarkable results established by the railway system may be mentioned the following :—

- I. The more thorough Circulation of Money.
- II. The Increase of Wealth.
- III. Increased Speed and Comfort.
- IV. The Creation of large Collateral Industries.
- V. The Stimulating of Invention.

With reference to (I.) the more thorough circulation of money, it has been brought about in a thousand different ways. How many thousands of pounds are spent every day of the year in railway travelling? How many millions are expended annually in meeting the numerous requirements of railways? What enormous resources are annually called into operation to supply the current de-

mands of railways? How far do railways tend to increase the demand for labour? The blue books show us that the working expenses of the English railways for last year reached £36,612,712; and that the total receipts from all sources reached £59,255,715, while the net receipts came to £26,643,003, being equal to a dividend of 4·37 per cent. on the total paid-up capital. It may be claimed for railways that they promote the circulation of money to a greater extent than the Bank of England itself, inasmuch as their operations are of an even more international character. But the obviousness of this result is such that we may be excused if we refrain from dwelling upon it at greater length.

Scarcely less obvious is (2.) the increase of wealth which railways have so largely assisted to promote. There is an old maxim that "a penny saved is a penny gained," and the law that applies to pennies is equally applicable to pounds. By providing a cheaper and more expeditious means of transport, railways have brought about a great economy of both money and time. Take, for example, the advantage which has thus been conferred on agriculture. A careful writer* has calculated that "a new line would on an average give fresh accommodation to three and a quarter miles on each side, being a total of seven square miles, or 4560 acres for each mile of railway. It would be a very moderate estimate to suppose that cartage would be saved on one ton of produce, manure, or other articles for each acre; and that the saving per ton would be five miles at eightpence per mile. Hence the total annual saving would be £768 per mile of railway, which is five per cent. interest on

* Baxter on Railway Extension and its Results.

£15,000. Thus it is almost impossible to construct a railway through a new district of fair agricultural capabilities, without saving to the landowner and the farmer alone the whole cost of line. Besides this, there is the benefit to the labourer of cheaper coals, and better access to the market. There is also the benefit to small towns of being put into railway communication with larger towns and wholesale producers. And there is the possibility of opening up sources of mineral wealth."

As to this result of railway development, it would be difficult to find more valuable testimony than that recently borne by Sir John Hawkshaw, the President of the British Association, who declared in his presidential address * that—

"Railways add enormously to the national wealth. More than twenty-five years ago it was proved to the satisfaction of a committee of the House of Commons, from facts and figures which I then adduced, that the Lancashire and Yorkshire Railway, of which I was the engineer, and which then formed the principal railway connection between the populous towns of Lancashire and Yorkshire, effected a saving to the public using the railway of more than the whole amount of the dividend which was received by the proprietors. These calculations were based solely on the amount of traffic carried by the railway, and on the difference between the railway rate of charge and the charges by the modes of conveyance anterior to railways. No credit whatever was taken for the saving of time, though in England pre-eminently time is money. Considering that railway charges on many items have been considerably reduced since that day, it may be safely assumed that the railways in the British Islands now produce, or rather save to the nation, a much larger sum annually than the gross amount of all the dividends payable to the proprietors, without at all taking into account the benefit arising from the saving in time. The benefits under that head defy calculation, and cannot with any accuracy be put into money; but it would not be at all over-estimating this question to

* Bristol Meeting, August 1875.

say that in time and money the nation gains at least what is equivalent to 10 per cent. on all the capital expended on railways. I do not urge this on the part of railway proprietors, for they did not embark in these undertakings with a view to the national gain, but for the expected profit to themselves. Yet it is as well it should be noted, for railway proprietors appear sometimes by some people to be regarded in the light of public enemies. It follows from these facts, that whenever a railway can be made at a cost to yield the ordinary interest of money, it is in the national interest that it should be made. Further, that though its cost might be such as to leave a smaller dividend than that to its proprietors, the loss of wealth to so small a section of the community will be more than supplemented by the national gain, and therefore there may be cases where a Government may wisely contribute in some form to undertakings which, without such aid, would fail to obtain the necessary support.

“And so some countries, Russia for instance, to which improved means of transport are of vital importance, have wisely, in my opinion, caused lines to be made which, having regard to their own expenditure and receipts, would be unprofitable works, but in a national point of view are, or speedily will be, highly advantageous. The empire of Brazil, also, which I have lately visited, is arriving at the conclusion, which I think not an unwise one, that the State can afford, and will be benefited in the end by guaranteeing 7 per cent. upon any railway that can of itself be shown to produce a net income of 4 per cent., on the assumption that the nation will be benefited at least to the extent of the difference.”

That railways have resulted (3.) in the promotion of increased speed and comfort is a conclusion which none will seek to dispute; but some may urge that these desiderata have been gained at the expense of safety. The old stage-coach was deficient both in speed and comfort, and those who had occasion to travel in it for long distances could not be otherwise than extremely tired and jaded at their journey's end. In the early days of the railroad great speeds were prohibited, because the popular voice was against them. Medical men pronounced that a speed of thirty miles an hour would

create all manner of physical evil, even if it were attainable; but few were prepared to believe in its attainment. At the opening of the Croft branch of the Stockton and Darlington Railway in 1829, Mr Mewburn was ridiculed for declaring, in a post-prandial speech, that in a few years a railway would be made from Darlington to London, and so quick would be the travelling, that passengers would leave the former place in the morning, arrive in London in time to go to the opera, and return home next day. But Mr Mewburn lived to see the advent of a day when it became possible to go to London, do a large amount of business, and return to Darlington, *all in one day*, and this achievement is not now regarded as anything remarkable! Times change, and we change with them!

As for comfort, there are those who devoutly and implicitly believe that a railway carriage is the most attractive and pleasant place on earth; and certainly the saloon carriages on some of our great trunk-lines, or Pullman's palace cars (which are now being adopted by some of our principal railway companies, initiated by the Midland), are not without many attractions that are hardly come-at-able elsewhere. Nor are these attractions limited to the æsthetic and refined taste with which the cars are equipped, to the sumptuous arrangements for lounging and sleeping, to the abundant facilities for killing time, and to the possibilities of both dining and drinking *ad libitum* with as much choice, and ease, and leisure as in the most elegantly appointed dining-room; but they extend to the cultivation of fascinating acquaintances and useful or intelligent friends. The science of sociology has no more curious phase than that which leads men not only to prefer the society of their kind, but to find a peculiar

sensation of pleasure, enhanced, probably by a pardonable curiosity, in cultivating the intimacy and learning something of the antecedents of travelling companions. And the resources provided by the modern railway *régime* render this pleasurable sensation capable of being purchased at a cheap cost and with little trouble.

But many timid people will still insist that all this is dearly bought when the dangers of railway travelling are taken into account. Well, it would be idle to pretend that the passenger travelling by rail does not expose himself to considerable risk. Day unto day uttereth speech on this matter. The most earnest apologist of railways could not by any process of logic establish the conclusion that they are devoid of danger. But then there is a degree of danger attached to every mode of locomotion. The old stage-coach had its hecatomb of victims, although travellers were then so few that accidents seemed to be very far between. Taking all things into account, it may fairly be doubted whether any other system of travelling is so safe. We believe it was John Bright who stated to a deputation that waited on him respecting railway travelling, that he thought a railway carriage was the safest place on earth. This remark was not so playful or enigmatical as it may, on the face of it, appear. Carefully compiled statistics show that there is only one passenger injured in every four million miles travelled. Sir John Hawkshaw has calculated that one may travel 100,000 miles each year for forty years, and the chances be slightly in favour of his not receiving the slightest injury!

The following tabulated statement* shows the proportion of killed to passenger journeys for the three years ending

* Captain Tyler's Report upon Railway Accidents.

1849, the four years ending 1859, the four years ending 1869, and 1870 :—

YEAR.	Number of Passengers killed from <i>all causes</i> beyond their own control.	Number of Passenger- journeys.	Proportion killed to number carried.
1847 } 1848 } 1849 }	36	173,158,772	1 in 4,782,188
1856 } 1857 } 1858 } 1859 }	64	557,338,326	1 in 8,708,411
1866 } 1867 } 1868 } 1869 }	91	1,172,255,942	1 in 12,881,933
1870	66	307,000,000	1 in 4,651,000

Perhaps we could not more appropriately take leave of this part of our subject than by quoting the following remarks of Captain Tyler, in his report upon the accidents which occurred on railways during the year 1870 :—

“ There is no doubt of the general safety of railway travelling as compared with other means of locomotion ; and it is certain that the most vivid imagination could not have supposed, a few years since, that so many passenger-journeys could be performed, and so much material conveyed, at such speeds, with so high a degree of safety. And the more intimately the numerous risks incurred at each mile, from human agency or defective materials, are known and understood, the more does the marvel increase. It is only by practical experience that such results have been achieved, and by practical demonstration that they can be credited ; and it is only by proof of what has been done, and may be done, that the further inference—how much more safely railway traffic may be conducted—is realised. It must, further, not be ignored, that the degree of efficiency which has already been reached is the result of a system of working by

separate companies, under various circumstances and conditions, and is not the result of uniform management or control."

The next result arising from the growth of railways is (4.) the creation of large collateral industries, and to this benefit it would be difficult to attach undue importance. Some idea of the huge magnitude of the works necessary to keep up the efficiency of existing railways—to say nothing of what is required for their extension and development—ought to be formed without difficulty in the North of England, where railways, directly or indirectly, afford employment to many thousands of hands. There is, indeed, no industry in the North of England that can claim precedence in extent and importance over that of the rail trade. Rails have long been the staple product of the mills and forges between the Tyne and the Tees. It is calculated that from 60 to 70 per cent. of all the finished iron made in the Cleveland district takes the form of railway *matériel*. What does this mean? Does it not imply that railways are the principal consumers of the coal used in the blast-furnaces of the North of England, that they have mainly stimulated the opening out of the ironstone mines of Cleveland, that they are the chief factors in the consumption of pig-iron, and that they have furnished the most direct and the most valuable incentives to the growth of the iron trade in general? This is much, but it is not all. It is not only that railways, with their continually recurring demands for iron, have raised that industry to a colossal bulk that it would never otherwise have attained, but it has actually called new industries into existence. Locomotive engineering is an industry almost *sui generis*, that would

never have had an existence but for the railway system.* Wagon-works, which are now springing up in all parts of the country,† have also been entirely a product of railways. Without railways, chair foundries—which also employ thousands of hands in different parts of the country‡—would not have had a name, nor would the numerous minor works for the manufacture of the thousand and one necessities of the railway system have been heard of. It is quite within the bounds of reason to assume that the amount of industry which the railway system is, either directly or indirectly, the means of employing, is greater than all the productive industry of the country—other than agricultural—previous to the commencement of the present century. And the importance of this industry increases year by year, adding to the wealth of the world and the happiness of its inhabitants. A clever French statistician has calculated that the old railway materials, on account of which renewals will be required, may be taken at six million tons in England, three million tons in France, ten million tons in America, and ten million tons in the rest of the world—making a total of thirty million tons of rails that must be renewed within fifteen years, assuming that period to be the maximum average life of rails made of iron. The productive resources of the rail-mills of the North of England are not now equal to the manufacture of more than 600,000 tons of rails per annum, so that, although that particular branch of our

* There are more than half a dozen large locomotive works in the North of England alone, affording employment to at least 6000 to 7000 hands.

† There is one establishment of this sort at Darlington, another at Hartlepool, and Mr Clay of Derby is about to erect another large wagon-building works at the former town.

‡ There are several large chair foundries at Middlesbrough and Stockton.

staple industry appears to be a very large one, and affords employment directly to something like 10,000 hands, it is yet a long way from adequate to meeting the requirements of the railway world on account of renewals alone. But the cost of renewals, after all, is a very inconsiderable item in comparison with the expenditure incurred in the formation of entirely new lines of railway. Nations on the brink of insolvency have tried to repair their shattered fortunes by an extension of their railway system. Countries rich as Golconda have found the introduction of that system necessary to the preservation of their wealth and prestige. In every country of Europe large railway extensions are being carried out, and in most countries further extensions are only hindered by a lack of ways and means. The experience of Great Britain has proved that the country with the most complete and perfect railway communication is the most wealthy and prosperous. Other nations have seen this, and profited by the knowledge. But even in Great Britain the railway system is far from having attained its full measure of stature.* At the end of last year the different railway companies in the United Kingdom had not less than 845 miles of additional lines in course of construction, being a larger mileage than that of any of the larger companies in the country, except the London and North-Western, the Midland, the Great Western, the Great Eastern, and the North-Eastern. Need we add that the construction of such extensive railway works provides employment for thousands of labourers, who probably could not earn such high remuneration in any other way, and involves a very large and rapid circulation of money?

* The following table, extracted from a recent issue of the *Engineer*, gives a fair idea of the importance of the new works being carried out, and the improvements effected in British railways, at the present time. The

A great deal more might be said, and said to interest and profit, on this aspect of railway results ; but it is needful that we should hasten to notice (5.) that another of these results, not less important in its way than any heretofore recorded, is the stimulus which the necessities of railways has afforded, and is still affording, to inventors. The perfection of the locomotive engine is a triumph of invention that stands out by itself, unapproached by any other ; and it may fairly be pronounced the basis and nucleus of all the other improvements that cluster around or possess

figures exhibit the expenditure on the different lines named for the half year ending December 1874 :—

	Lines open.	Working Stock.	Lines constructing.	Total.
Belfast and Northern Counties	£16,204	£8945	...	£25,149
Bristol and Exeter . . .	58,707	69,612	£13,799	142,118
Caledonian	441,038	189,874	399,337	1,030,309
Furness	56,699	51,473	274,475	382,647
Glasgow and South-Western	171,669	89,579	225,418	486,666
Great Eastern	86,226	53,655	160,892	300,776
Great Northern	329,051	155,180	1,120,560	1,604,791
Great Southern and Western .	34,314	39,417	24,276	98,007
Great Western	493,790	285,996	300,359	1,080,145
Lancashire and Yorkshire . .	589,149	240,953	448,222	1,278,324
London, Brighton, & South Coast	157,859	84,943	...	242,802
London, Chatham, and Dover	486,887	12,207	...	499,094
London and North-Western . .	1,502,423	283,950	248,816	2,035,189
London and South-Western . .	342,288	129,642	104,787	576,717
Manchester, Sheffield, & Lincoln	262,644	87,697	544,361	894,702
Maryport and Carlisle . . .	3309	2911	...	6220
Metropolitan	85,506	...	81,908	167,414
Metropolitan District . . .	132,284	4302	244,444	381,030
Midland	926,270	265,130	1,635,802	2,827,202
Midland Great Western . . .	37,421	4854	...	42,275
Monmouthshire	21,474	6142	2781	30,397
North British	97,417	43,233	151,813	292,463
North-Eastern	614,000	923,758	413,055	1,950,813
North London	31,415	8506	2483	42,404
North Staffordshire	127,468	40,512	25,020	193,000
South Devon	92,474	32,144	105,257	229,875
South-Eastern	38,675	38,833	95,614	173,122
Taff Vale	9474	33,775	51,988	95,237
Ulster	4789	13,278	118	18,185
Totals	7,250,924	3,200,501	6,675,648	17,127,073

affinity with it. But while keeping steadily in view the paramount importance of this invention, we cannot forget that a multitude of subsidiary inventions claim no mean place in the annals of mechanical achievement. To merely catalogue these would exceed the whole limits prescribed for this volume. The improvements in rolling stock and permanent way are legion. But without invidiousness, we may particularly call attention to the now general adoption of an air-brake, by means of which it is possible to stop a train running at forty to fifty miles an hour within the distance of its own length; and the ingenious block system, by the adoption of which the liability to misadventure is reduced to a minimum, and of which we may here remark, that its initial adoption in the North of England was carried out under the auspices of the Stockton and Darlington Railway Company and the supervision of Mr Walker.

Perhaps it will not be deemed inopportune or irrelevant to the purpose of this chapter if notice is here taken of some of the distinctive features of the Stockton and Darlington Railway management. Economy was always closely studied, and yet parsimony could never be laid to the company's account. The directors made it a standing rule to ascertain the cheapest market consistent with due quality, and buy there. The Quaker element has been distinguished for nothing, perhaps, so much as for the business tact and thorough mastery of details which it imported into the directorate. It has often been claimed for the Stockton and Darlington Railway that it was the cheapest line in the country. Nor is this boast without sufficient reason. Up to 1850, the cost of the Stockton and Darlington Railway proper did not exceed £14,200

per mile. This figure compares most favourably with the cost of other railways. The York, Newcastle, and Berwick line cost £29,400 a mile. The North British Railway cost £38,300 per mile. The Midland Railway cost £44,000; the London and South-Western, £33,000; the London and North-Western, £41,600; the Lancashire and Yorkshire, £61,200; and the Lancaster and Carlisle—which the promoters claimed to be the cheapest line then constructed—cost £18,456 per mile up to the same date. The same characteristic economy appears in the working stock of the company, although the working stock was, according to the distance travelled, greatly in excess of every other company's; yet we find it calculated in 1850, that it was only £2300 per mile, while the stock of the Lancashire and Yorkshire Railway cost, at the same date, £3200; that of the London and North-Western, £2600; that of the London and South-Western, £2800; that of the London and Brighton, £3200; and that of the Edinburgh and Glasgow, £4600 per mile.

Allusion has already been made to the fact that the Stockton and Darlington Railway paid during the first five years of its existence an average dividend of about five per cent., and that subsequent to that date its dividends took a higher range. It is interesting to compare this condition of things with that which relates to other companies in the district, and it would be impossible to make such a comparison in better or more striking terms than those chosen by Joseph Pease, when speaking on the operations and antecedents of the company at the first half-yearly meeting of shareholders for 1850. "The tolls," he said, "have, through competition, been reduced lower than the exigencies of the case require. Our first competitors were

the Clarence Company. They expended £300,000, and their line is said to have paid but about 60s. dividend from the first. The Stockton and Hartlepool Company never declared a dividend at all. Of the companies to the north, the Bruadling Junction line had ceased to pay any dividend when they were handed over to the York and Berwick Company. The Sunderland and Durham were in the same position when handed over to that company. The Stanhope, with £200,000 capital, paid no dividend. The West Durham, opened about fifteen years ago, has never paid one farthing dividend. There stands out, in very striking prominence, the Hartlepool Old Dock and Harbour Company, which has paid a fair dividend from time to time, and was handed over to the York and Berwick Company ; but the other railroad connecting that line, called the Hartlepool and Clarence and Great North of England, never paid any dividend at all."

CHAPTER XXII.

INDUSTRIAL DEVELOPMENT ON THE STOCKTON AND DARLINGTON RAILWAY.

FEW things could be more cognate to the scope and purpose of this work than a record of the growth of the staple industries of the North of England during the last fifty years. To a certain extent this phase of development has been dealt with in previous chapters. Incidental and collateral allusions have been made to the broad and general results of the operation of the railway system; and, perhaps, so far as the general reader is concerned, nothing more is necessary or desirable. But a volume of this kind is almost necessarily, and in its very essence, of a commercial and industrial tendency. Railways have many characteristics, but their commercial features are undoubtedly the most predominant. Railway men are commercial men more than anything else—at least so far as their relation to the railway system is concerned. The development of commerce was the primary purpose of the establishment of railways, and for and by commerce they are maintained. The commercial results of the railway system have nowhere been more striking than in the district served by the Stockton and Darlington Railway. Those results have manifold aspects, and may be approached from many different points of view. We shall, first of all, deal with their purely statistical aspects.

Stockton, in the early years of the present century, carried on a very insignificant shipping trade. Its exports were almost exclusively confined to lead and corn. In 1821 there were 72,228 pigs, or pieces of lead, shipped from the port, and this quantity was somewhat exceeded in each of the four following years, the largest aggregate being 104,663 pigs in 1822. The lead was chiefly brought into Stockton by carts or wagons from Weardale and Teesdale. It had to be carried for long distances at a heavy cost. Of wheat-flour we find that 56,154 sacks were shipped at Stockton in 1821, together with 7508 quarters of wheat, and 9586 quarters of oats. The gross receipts from custom-duties for the same year reached £9107. The imports were of limited extent, and comprised fir timber, wainscot logs, staves, masts, and spars of all sorts, hemp, flax, oak-bark, tallow, linseed, clover-seed, raw linen yarn, iron, hides and skins, &c.

The condition of the port of Stockton was one of almost steady decadence in the first thirty years of the nineteenth century. So far back as 1760, we find that eighty-one British ships, and forty-three foreign ships cleared from the port; but nine years later, the number of British ships clearing outwards was reduced to seventeen, while the number of foreign ships had fallen to six.* In 1795 there were forty-seven vessels belonging to Stockton, carrying 5730 tons register.

The following tabulated statement shows the growth of the shipping trade of the Tees ports, distinguishing the British from the foreign vessels that have cleared outwards in each year between 1830 and 1841, both inclusive :—

* Brewster's History of Stockton, p. 201.

YEAR.	British.		Foreign.	
	Ships.	Tons.	Ships.	Tons.
1830	3	262	4	318
1831	9	1019	2	144
1832	6	754	2	221
1833	15	2340	9	1039
1834	51	7339	15	1080
1835	123	18,899	39	3010
1836	113	18,990	197	12,322
1837	124	20,077	274	66,555
1838	216	38,160	410	26,615
1839	301	52,307	824	32,791
1840	364	65,181	544	35,763
1841	454	80,139	596	44,392

The only figures available as to the early progress of the export coal trade of the port of Stockton* show the following results:—

YEAR.	Coastwise.	To Foreign Ports.	TOTAL.
	Tons.	Tons.	Tons.
1822	1224	...	1224
1823 . . . .	...	...	...
1824 . . . .	...	...	...
1825 . . . .	...	...	...
1826	10,754	...	10,754
1827	32,182	...	32,182
1828	66,051	...	66,051
1829 . . . .	...	...	...
1830 . . . .	...	...	...
Total	110,211	...	110,211

* Report of Coal Commission of 1871.

The total shipments for the next ten years were as follow:—

YEAR.	Coastwise.	To Foreign Ports.	TOTAL.
	Tons.	Tons.	Tons.
1831 . . . .	...	...	...
1832 . . . .	...	...	...
1833	578,800	3700	582,500
1834	623,484	9988	633,472
1835	677,941	26,840	704,781
1836	916,440	36,942	953,382
1837	1,145,837	46,516	1,192,353
1838	1,219,938	86,699	1,306,637
1839	1,308,778	111,707	1,420,485
1840	1,367,532	132,842	1,500,374
Total	7,838,750	455,234	8,293,984

It will be observed that there is here an increase coastwise of 788,732 tons in eight years, and an increase foreign during the same time of 129,142 tons, making a total of 917,874 tons. But in 1845 the shipment of coals was commenced at Hartlepool, and this interfered with Stockton's progress to a very material extent ; although it is a fact for which many will not be prepared, that from 1840 to 1850, both inclusive, the aggregate shipments of coal from Stockton reached 17,019,714 tons, as compared with only 18,340,200 tons shipped in the same period from Sunderland.

The following table shows the shipments of coal from

what were, up to 1850, the three principal ports on the north-east coast for the export of coal :—

YEAR.	Newcastle.	Sunderland.	Stockton.
	Tons.	Tons.	Tons.
From 1801 to 1810 .	15,488,784	8,370,644	...
„ 1811 to 1820 .	18,227,100	10,020,639	...
„ 1821 to 1830 .	28,649,788	13,527,941	110,211
„ 1831 to 1840 .	25,429,476	12,164,794	8,293,984
„ 1841 to 1850 .	32,185,304	18,340,200	17,019,714

Between 1828 and 1835 the shipment of coals from Stockton to London showed a continuous increase, as the annexed figures will show :—

YEAR.	Ships.	Weight delivered.	TOTAL.
	No.	Tons.	Tons.
1828	100	19,448	110,413
1829	48	3902	
1830	162	24,314	
1831	337	62,749	
1832	783	172,930	795,756
1833	773	170,690	
1834	1007	221,971	
1835	966	230,174	

The increase in the last four years is 685,352 tons.

We next come to the total shipments of coal from Stockton for the decimal period 1851-60 :—

YEAR.	Coastwise.	To Foreign Ports.	TOTAL.
	Tons.	Tons.	Tons.
1851	388,646	88,808	477,454
1852	336,821	74,936	411,757
1853	289,135	89,334	378,469
1854	212,526	86,312	298,838
1855	142,205	92,505	234,710
1856	153,341	106,937	260,278
1857	158,367	117,390	275,757
1858	191,344	112,915	304,259
1859	197,526	103,606	301,132
1860	217,712	120,941	338,653
Total	2,287,623	993,684	3,281,307

Here it will be seen there is a decrease coastwise of 170,934 tons, and an increase in the foreign shipments of 32,133 tons, making a total decrease of 138,801, or 29·0 per cent. In 1844 and the years preceding, the shipments from Hartlepool are included in those of Stockton, but from that date separate accounts were kept. This will largely account for the falling off in the bulk of coal shipped from Stockton in the two decades, but it fails to afford an adequate explanation of the tremendous decline that appears in the shipments for the following nine years:—

YEAR.	Coastwise.	To Foreign Ports.	TOTAL.
	Tons.	Tons.	Tons.
1861	3108	1507	4615
1862	846	3469	4315
1863	560	2079	2639
1864	707	758	1465
1865	682	50	732
1866	69	127	196
1867	255	185	440
1868	180	1283	1463
1869	1016	788	1804
1870 . . . . .	...	...	...
Total for 9 years .	7423	1024	17,669

There is a decrease coastwise here of 2092 tons, and a decrease foreign of 719 tons, making a total decrease of 2811 or 15·58 per cent. It is necessary to explain that up to 1860 the shipments from Middlesbrough, which had come into operation as a coal-port so far back as 1830, were included in those of Stockton, nor was it until 1861 that independent returns were available for the former port. But the following figures, giving the total shipments of coals from Middlesbrough between 1861 and 1869, both inclusive, conclusively prove that previous to the former year the coal trade of that port must have attained very respectable dimensions:—

YEAR.	Coastwise.	To Foreign Ports.	TOTAL.
	Tons.	Tons.	Tons.
1861	202,444	142,392	344,836
1862	175,504	135,372	310,876
1863	178,493	128,116	306,609
1864	212,993	110,696	323,689
1865	193,935	145,373	339,308
1866	151,772	123,395	275,167
1867	138,309	107,142	245,451
1868	93,005	81,883	174,888
1869	76,198	67,662	143,860
Total for 9 years .	1,422,653	1,042,031	2,464,684

Here, again, we find a total decrease of 200,976 tons,—equal to 139·70 per cent.—principally in the coastwise trade; and it may be remarked that since 1869 this decrease has been even more remarkable, for in 1873 the total quantity of coal and coke shipped from Middles-

brought to London and other ports in the United Kingdom was only 15,706 tons, while the foreign shipments only attained 55,421 tons.* As for Stockton, its coal trade in the interval between 1869 and 1874 had sunk almost to zero, the total foreign shipments for 1873 being only 244 tons, while the shipments coastwise were altogether *nil*.

Although the port of Hartlepool was not directly within the jurisdiction of the Stockton and Darlington Railway, and might, therefore, if we were here to draw a hard and fast line in dealing with the effects produced by that system, claim exclusion from this chapter, it ought not to be forgotten that it was the Stockton and Darlington line, in the first instance, that stimulated the trade of that port. The coal sent to Hartlepool for shipment was mainly vended from the South Durham collieries, and passed over part of the parent line before they were transferred to the Clarence Railway, whence they were conveyed to Hartlepool. We have no access to records of the shipment of coals from Hartlepool earlier than 1845, but from that year to 1850, both inclusive, the shipments were—

YEAR.	Coastwise.	To Foreign Ports.	TOTAL.
	Tons.	Tons.	Tons.
1845	726,183	158,225	884,408
1846	601,481	186,437	787,918
1847	703,113	186,478	889,591
1848	922,568	243,060	1,165,628
1849	1,037,390	253,704	1,291,094
1850	1,232,500	329,900	1,562,400
Total	5,223,235	1,357,804	6,581,039

* Browne's Export List.

It will be observed that these figures show a total increase of 677,992 tons, or 76·6 per cent. For the next ten years the shipments from Hartlepool were as under—

YEAR.	Coastwise.	To Foreign Ports.	TOTAL.
	Tons.	Tons.	Tons.
1851	1,137,989	350,509	1,488,498
1852	1,340,876	391,538	1,732,414
1853	1,278,417	443,291	1,721,708
1854	1,268,583	409,780	1,678,363
1855	1,138,749	469,080	1,607,829
1856	1,110,232	526,851	1,637,083
1857	1,153,562	520,583	1,674,145
1858	1,212,981	530,852	1,743,833
1859	1,580,999	549,478	2,130,477
1860	1,322,105	579,318	1,901,423
Total	12,544,493	4,771,280	17,315,773

Here there is an increase coastwise of 184,116 tons, a foreign increase of 228,809 tons, and a total increase of 412,925 tons, or 27·74 per cent. In the ensuing nine years, however, we find a very different result—

YEAR.	Coastwise.	To Foreign Ports.	TOTAL.
	Tons.	Tons.	Tons.
1861	1,408,966	624,281	2,033,247
1862	1,307,260	618,183	1,925,443
1863	1,232,217	595,292	1,827,509
1864	1,162,956	549,783	1,712,739
1865	993,880	570,802	1,564,682
1866	903,834	604,962	1,508,796
1867	895,470	670,813	1,566,283
1868	858,631	689,046	1,547,677
1869	835,499	618,425	1,453,924
1870 . . . .	...	...	...
Total for 9 years .	9,598,713	5,541,587	15,140,300

Instead of an increase of 27·74 per cent., as in the preced-

ing ten years, we find in these nine years a total decrease of 32·96 per cent., or 579,323 tons.


There are various ways of accounting for the general falling off in the shipment of coals from the Tees ports between 1850 and the present time. The principal reason is undoubtedly the extraordinary demand that has been created within that period for coal suited to the purposes of metallurgy. The coal of South Durham is more suited to this than to any other purpose, and hence the great bulk of the output of the South Durham collieries went into local consumption, the demands made by the iron trade of Cleveland increasing in a ratio so rapid, that it was found difficult to supply them ; while coal-owners found that it was more to their advantage to supply local than foreign consumers. There is also the fact that the ports of Sunderland and Newcastle offered better facilities for shipment than the Tees ports, the navigation of which was hindered and harassed for many years by the inadequate character of the harbour accommodation, and the insufficient depth of water in the Tees for vessels of any size—that river being, up to 1852, divided into three channels, and in the best of these three there was not more than one foot ten inches at low-water spring tides, while all of them were very crooked, and consequently very difficult to navigate.

But if the trade of the Tees ports has in recent years fallen off with respect to the shipment of coals, it has made wonderful advances in the development of commerce otherwise. This development is, of course, mainly due to the *growth* of the iron trade, which has been the instrument of raising Middlesbrough to the front rank among the ports of the north-east coast. So recently as 1864 the total value of the exports from Middlesbrough, other than coal and

coke, was £390,650; in 1867 it was £682,469; in 1868, £717,454; in 1869, £1,040,331; in 1870, £1,267,111; in 1871, £1,593,347; in 1872, £2,647,883; and in 1873, £3,267,483! The exports of Newcastle for the latter year, other than coal and coke, only reached a value of £3,151,701, and those of Sunderland only £162,213. Middlesbrough, therefore, stands pre-eminent in respect of its exports, other than coal and coke.

Within the period to which these figures apply, Stockton has also made considerable improvements in the value of its exports, which increased from £5136 in 1864 to £50,356 in 1873. But the superior facilities of shipment at Middlesbrough, and its nearness to the sea, have drawn thence nearly all the trade of the Tees that passes Hartlepool. In the value of the exports from Hartlepool—other than coal and coke—there has not been much change during the last ten years. Until within the last few years the great bulk of the iron and other merchandise exported from the Tees ports was shipped at Hartlepool, because of its greater safety as a harbour, and this accounts for the fact that in 1873, the value of the exports named was considerably less than in 1865, and several subsequent years.

As cognate to the industrial development of the district traversed by the first public railway, we may briefly allude to the works undertaken by the Tees Conservancy Commissioners and the North-Eastern Railway Company for the improvement of the ports on that river. Few rivers have been more thoroughly engineered than the Tees. In 1762 the depth of water on the bar was only four feet; and from 1840 to 1860 it varied from 12 feet 6 inches to 3 feet at low-water spring tides, the average depth being about 9 feet. There were three different channels, each, if anything more



difficult and dangerous to navigate than the other. Up to 1855 little had been done to mend this state of things. The result was highly inimical to the trade of the port, which fell from 742,521 tons in 1846 to 290,658 tons in 1855. In the latter year, however, the Conservancy Commissioners, who, under the Act of 1852, succeeded the old Tees Navigation Company, commenced in earnest to improve the river. Their first operations embraced the shutting up of the north and middle channels, and the guidance of the whole of the tidal water through the north channel. At the same time they commenced the dredging of Cargo Fleet "Scarp"—a shoal which had been a great obstruction to the navigation of the river—through which a channel was cut 200 feet in breadth, and giving a depth of seven feet at low water. They also projected and completed the erection of training walls, and in 1860 they undertook the construction of a breakwater, stretching from near Eston Junction to the sea, a distance of over 10,000 feet, of which 613 yards still remain to be completed. In the construction of this breakwater, 2,702,673 tons of slag had been used up to the end of August in this year. The cost of the work has been close on a hundred thousand pounds, and of this amount the ironmasters have paid for the removal of their slag—which relieves them of an eyesore and source of loss—more than one-fifth. By means of this breakwater the lateral channels, in which the flowing and ebbing tides waste their strength, will be shut up, and the lower reaches of the river will be effectually sheltered.

Since the Tees Conservancy Commissioners commenced operations they have increased the depth of water in that river between the bar and Middlesbrough from under two to nine feet; and it is in contemplation to construct

another breakwater on the North Gare, which will allow a depth of twenty feet to be attained in the anchoring pools at low-water spring tides. The Commissioners propose, moreover, to continue dredging operations until they have attained an average depth between the ports of Middlesbrough and Stockton of not less than nine feet. But this is not all. During the last twenty years the Commissioners have erected eighteen miles of training walls, and they have dredged almost uninterruptedly for a period of nineteen years.

Their labours have not gone unrewarded. The revenue of the Conservancy Board has increased from about six thousand pounds to considerably over twenty thousand pounds per annum within fifteen years, and the tonnage of the ships frequenting the port during that time has considerably more than doubled. At the present time, in addition to their dredging operations, and the construction of the South Gare breakwater, the Commissioners are engaged in the removal by the diamond rock-drill of the Eighth Buoy Scarp—a huge boulder of rock with an area of 500 yards long by 200 yards wide, and with 110,000 yards of cubical contents.

The efforts of the Conservancy Commissioners in the channel of the Tees have been efficiently supplemented by those of the North-Eastern Railway Company in the docks of Middlesbrough and Hartlepool. The original Middlesbrough Dock was constructed by the Middlesbrough owners in the years 1840–42, and was opened in the latter year. It consisted of a water area of between five and six acres, with an entrance thirty feet in width, having a depth of eighteen feet above the sill at high-water spring tides. In August 1869, the North-Eastern Railway Company

commenced the extension and improvement of the original dock. They increased the water area by five acres, constructed a new entrance fifty-five feet in width, and added a total length of stone quay equivalent to 1626 feet. The latter dock has been of great public utility, and has already brought a considerable increase of trade to the port. The works projected and in progress at Hartlepool are of a still more extensive kind; but we cannot dwell upon them here.

The growth of the Cleveland iron trade, which has necessarily a very intimate relation to the history of the Stockton and Darlington Railway, has already been spoken of as one of the most remarkable examples afforded by the Old World of the splendid results of discernment and enterprise. This is no time or place to enter upon a history of the iron trade of Cleveland. A theme of such vast extent could not be adequately dealt with in a dozen chapters of much greater length than this. But it may not be travelling out of the record to indicate briefly the various stages of its development.

In 1850 the quantity of pig-iron made from the ironstone of Cleveland was practically *nil*. Ample evidence can be brought to show that for seven or eight years previous to 1850, practical men were aware of the existence of the ironstone of Cleveland; but up to that year the enterprise essential to its development does not appear to have been forthcoming.* Even up to 1854 the North of England furnished less than 20 per cent. of the whole make of pig-iron in the British Isles, which was estimated in that year to be 3,069,838 tons; and in 1856 the average

* *Vide* Practical Magazine for August 1875.

number of blast-furnaces in activity during the twelve months was only thirty-three, while their aggregate production was only 247,500 tons. Of this quantity, 49,807 tons were shipped to foreign ports, 25,800 tons were in stock at the end of the year, and 190,393 tons remained for local consumption. From 1856 to the present time the iron trade of Cleveland has pursued a career of unparalleled prosperity. The following figures, compiled from official documents, show the graduated growth of the staple industry of Cleveland during the last sixteen years:—

					Tons.
In 1859 the pig-iron made from Cleveland ore was					620,062
1860	"	"	"	"	633,000
1861	"	"	"	"	607,000
1862	"	"	"	"	705,529
1863	"	"	"	"	838,400
1864	"	"	"	"	926,054
1865	"	"	"	"	957,311
1866	"	"	"	"	1,043,529
1867	"	"	"	"	1,156,953
1868	"	"	"	"	1,233,418
1869	"	"	"	"	1,459,508
1870	"	"	"	"	1,695,377
1871	"	"	"	"	1,884,239
1872	"	"	"	"	1,968,972
1873	"	"	"	"	1,999,491
1874	"	"	"	"	2,001,233

The total quantity of pig-iron produced in the United Kingdom in the latter year was 6,566,451 tons, so that Cleveland contributed nearly one-third of the whole.

The growth of the finished iron trade generally follows that of the pig-iron trade in districts suited for its development, and Cleveland has formed no exception to this rule.

We find, on the contrary, that within twenty years, nearly 2000 puddling-furnaces have been built in the North of England. These are unitedly equal to the production of more than a million tons of finished iron per annum, and, with their accessory appliances, furnish employment to nearly 20,000 hands.

DIVISION II.



PIONEERS OF THE RAILWAY SYSTEM.



Edward Pease

PIONEERS
OF
THE RAILWAY SYSTEM.

EDWARD PEASE,

THE "FATHER OF RAILWAYS."

EDWARD PEASE, the "father of railways," belonged to a Quaker family of high respectability, although making no pretensions to patrician lineage. Of their antecedents little is known that dates beyond the eighteenth century. A writer, who has bestowed more than usual attention on the study of genealogy, has put on record that the Darlington family of Pease has descended from a West Riding family of that name, settled near Wakefield, where an old house called Pease Hall is still extant; "that they and the Peases, bankers, at Hull, are of the common stock; that the Darlington branch particularly trace from an austere father who considered himself qualified to think for his children as well as himself, and turned the Darlington ancestry from house and home for becoming Quakers, somewhere, of course, on this side of the Civil Wars; and that thereupon the rejected ones, very sensibly making the best of

their decadence in caste, rushed into manufactures and trade, and have created more money and noise in the world than ever did their inheriting fathers." * A subsequent writer has traced the pedigree of the family as far back as "William Pease of Fishlake (married to Alicia Cliff at Fishlake, county of York, March 25, 1565), son of Edward Pease of Sike House and Fishlake, county of York, temp. Henry VIII., who died intestate, seised of lands at Sike House, county of York; and through him to John Pease, defendant in a plea touching land in the county of Essex, 10th Henry VII. The births and deaths and marriages of an unbroken line appear in the record." †

So far as the Darlington branch of the now distinguished family is concerned, its history may be said to originate with Joseph and Ann Pease, the parents of the first Edward Pease, who was born in that town in 1711, and died there on the 14th of November 1785. The eldest son of this Edward Pease was named Joseph. He was born at Darlington on the 25th March 1737, and married Miss Mary Richardson on the 13th October 1808. The fruit of this union was *the* Edward Pease, the lines of whose biography we have here undertaken to trace.

Like his father and grandfather before him, Edward Pease was trained to the business of a woollen-manufacturer. The mills wherein he laid the foundation of his prosperity and that of his sons were situated at the bottom of Priestgate, and in the Lead Yard; and part of the original factory may still be seen, although the Lead Yard premises have recently been vacated in favour of another erection attached to the Priestgate mills.

* Longstaff's History of Darlington.

† Joseph Pease : a Memoir.

Of his earlier career we have only fragmentary and imperfect details. Every available item of information tends to show that he was a practical exponent of the Carlylean gospel, "Produce! produce! were it but the pitifullest infinitesimal fraction of a product, produce it in God's name!" Diligent in business beyond the custom of most men, he lived to learn that "in all labour there is profit."

Darlington was then a town of very limited importance. Its population was shown by the census of 1821 to be only 5760, being an increase of 691 on the population of 1811. The pace of the age was slow, and there was little scope for achieving distinction of any sort in the ordinarily quiet and uneventful life of the factory. We learn, indeed, of nothing that occurred to interfere with the placid and even tenor of Edward Pease's career until 1817, when the woollen factory on the site of the old Bishop's Mill was completely burned down, involving a loss of £30,000, and throwing about five hundred people out of employment.

It was about this time that Edward Pease threw himself into the thick of the agitation that had long previously been pending for the projection of additional facilities of transport in South Durham. In Stockton, as already indicated, the popular feeling was favourable to the construction of a canal between the Tees and the collieries of South Durham. But Pease and the friends with whom he took counsel saw that a railway would be better likely to suit the purpose aimed at, and took up a position of antagonism to the Stockton people, or, at any rate, to that section which sought to bring the canal scheme to maturity.

It soon became apparent that Mr Pease was pre-eminently one of those men who believe that "the end of

man is an action, and not a thought." He became the recognised leader of the railway party, as contradistinguished from the party promoting the canal. It is said that at first he contemplated only a horse tramroad between Stockton and Darlington; "but as he proceeded with the project, and especially after he became personally acquainted with George Stephenson, he gradually, but cautiously, became a convert to the railway system." * The same author informs us, that "in projecting a railway from Witton Colliery, above Darlington, to Stockton, in the year 1817, Edward Pease stood almost alone;" and that what he first contemplated "was merely the means of effecting land-sales of coal at the stations along the proposed railway."

It need hardly be said that, in his endeavours to get up a company for the formation of the Stockton and Darlington Railway, Edward Pease had difficulties of no ordinary kind to meet and conquer. The prejudices and traditions of the times were against him. Cold water was thrown upon the scheme to such an extent that it is now a legitimate wonder that it was not drowned out. George Stephenson subsequently remarked, that if the people made railways, the railways would make the country. But only men like Edward Pease, of whom it was truly said that "he could see a hundred years ahead," could then discern the coming events which had already begun to "cast their shadows before." From landowners in particular he encountered fierce opposition, and the voice of the landed proprietary was much more potent then than it has since become. But it has never been laid to the charge of the Pease family that they looked back after putting their hand to the plough. To this rule Edward was no exception.

* *Life of George Stephenson*, by Samuel Smiles.

He had much influence with his friends and neighbours, and he succeeded in enlisting the sympathies and co-operation of some of the wealthiest residents in the neighbourhood, including the Backhouses, the Richardsons, the Meynells, and the Stobart family. Between Mr Jonathan Backhouse and himself, however, there was at one time likely to be a serious point of disagreement. Mr Backhouse approved of the line of railway from the collieries to Darlington, but recommended the construction of a canal from Darlington to Stockton. Mr Pease, on the other hand, was strongly opposed to a broken line of communication, and stood out for having it all of one kind, whether railway or canal, while he disapproved of a canal, because he contended that it could never be made so valuable as a railway. The problem was solved, on the recommendation of Mr Meynell, by calling in a Welsh engineer, Mr Overton, who made a survey of the proposed route, and recommended the construction of a railway along its entire length. Upon this report, Mr Backhouse fell in with the views of Mr Pease, and the preliminaries for the first railway Bill were proceeded with.

With only two notable exceptions, the landed gentry in the county opposed the passing of the Act. Those exceptions are worthy of being remembered. They were Mr Meynell, afterwards the chairman of the company, and Mr Benjamin Flounders. Owing to the opposition of the landowners, the first bill was thrown out, but only by a majority of thirteen, no less than one hundred members voting for its second reading. This result appears to have astonished the opponents of the Bill. One noble Lord is reported to have said, that "If the Quakers in these times, when nobody knows anything about railways, can raise up such

a phalanx as they have on this occasion, I should recommend the county gentlemen to beware how they oppose them."

Mr Pease was defeated, but not disheartened. Another survey of the proposed railway was undertaken by Overton, and, on the recommendation of the Hon. Mr Maule (afterwards Lord Panmure), the Friends resolved to call in the services of Mr Robert Stevenson of Edinburgh, engineer of the Bell Rock Lighthouse. That gentleman came to Darlington, and recommended for the course of the proposed railway the line of Rennie's canal. Such a proposal, however, involved giving Darlington the go-by; and as this did not accord with the views of the promoters, Mr Stevenson was not appointed engineer. Mr George Stephenson was next communicated with, under circumstances detailed in the foregoing pages, and made a survey and report which were ultimately adopted.

A second Bill was prepared, and the company went to Parliament a second time. But now another difficulty was experienced of a very different kind. Parliamentary rule required that, before going into committee with the Bill, two-thirds of the required subscriptions should be filled up. On looking into the subscriptions, Mr Mewburn, the solicitor to the company, found that they were £10,000 short of this amount. Nothing could be done until this deficit was made good. Mr Mewburn got introductions to the Stock Exchange and to several wealthy merchants in London, through whom he endeavoured to supply the deficiency, but he failed in his endeavours, neither the Stock Exchange nor the general public having then sufficient confidence in the proposed scheme to risk their money in it. In this strait, Mr Pease was communicated

with. Mr Mewburn wrote him from London that "he must come home unless he received subscriptions for the sum named within three or four days." But the subscribers in Darlington and its neighbourhood had already invested all they could spare or cared to risk in such a doubtful venture. Not another farthing could be raised among them, and Mr Pease at last subscribed the whole £10,000 himself, in addition to the amount he had previously guaranteed. With reference to this incident Mr Mewburn has stated, "without the slightest fear of contradiction, that if Mr Pease had not subscribed this amount, the railway would never have been made by Darlington, the communication would probably have been carried by the Clarence route, and the public generally would have suffered. It was to the talent and firmness displayed by Mr Pease throughout the whole of these proceedings, that they owed the success of the undertaking."

The second application to Parliament was successful, and the Bill for the construction of the Stockton and Darlington Railway passed into law. But even then Mr Pease's difficulties were far from ended. Some of them have been alluded to in our annals of the line. Another of a more personal character may be fitly related here. When George Stephenson was surveying the proposed line *viâ* Darlington, he remarked to Mr John Dixon, his assistant, that the railway should be carried by Rushyford and Sedgefield. This opinion Mr Dixon took occasion to report to Mr Pease. The latter at once sent for Stephenson, and told him that he had been employed to improve the line, and not to take it away, "for if he took it away from Darlington, he would take away the communication with Yorkshire, and ultimately with the

rest of the kingdom." Mr Stephenson lived long enough to see and admit that Edward Pease was in the right.

To follow closely the career of Mr Pease from this time forward would almost be equivalent to rewriting the history of the Stockton and Darlington Railway, with the fortunes of which he continued to be more or less identified up to the time of his death. Mr Pease had almost reached a time of life when most men begin to think of repose at the time the first public railway was projected. When the Stockton and Darlington line was opened in 1825 he was bordering on sixty. But the physical and mental adolescence of youth was still upon him. He continued for many years to be the ægis and mentor of the line which called him parent; and when at last he found that the infirmities of age compelled him to make way for another and younger generation, he had the proud and pleasing satisfaction—accorded, alas! to so few—of seeing more than he had ever expected or conceived of the fruition of his labour and desire.

On the 20th of February 1857, a movement was set on foot in his native town for raising a testimonial to Mr Pease. A meeting of the inhabitants of Darlington, presided over by Mr Mewburn, was held in furtherance of this project. The meeting resolved as follows:—

"That, deeply impressed with the immense advantages of the exertions of Edward Pease, Esq., in promoting in the year 1818 the first public railway in the kingdom (Stockton and Darlington Railway), and in subsequent years prosecuting the scheme of railway enterprise with indomitable perseverance, under difficulties almost inconceivable at the present day, it is expedient to record the facts by some testimonial, as a proof of the estimation in which he is held in his native town of Darlington, its neighbourhood, and the district generally.

"That, in consequence of such means of locomotion, sources of

wealth have been developed, the entire kingdom advanced, and the comfort and convenience of the public wonderfully increased, every railway company in Great Britain be communicated with, in order to afford them the opportunity of co-operating in this national tribute to a man who still lives to witness, with the liveliest satisfaction, the result of his early labours.

“That, considering Mr Pease has directly and indirectly been the means of developing to an extraordinary extent the mineral wealth of this district in particular, and thereby stimulating every branch of trade and commerce in the country at large, communications be made with employers and employed, affording an opportunity to masters and operatives of assisting in a testimonial commemorating the services of that gentleman.”

There was a considerable difference of opinion as to the form which the proposed memorial ought to take. A bronze statue was suggested among other things. It was eventually decided that, before coming to a decision, Mr Pease and his family should be consulted. This was done by Mr Mewburn; and the reply he received was the expression of an earnest wish “that no such testimonial should be prepared or further thought of.” About the same time Mr Mewburn received from the fine old patriarch—then in his ninety-first year, a characteristic note—dated the “3d mo., 6, 1857,” in which he stated that his friends “had done him some injustice in doing him more than justice,” and added, “it seems to me that Providence has condescended largely to bless our designs and efforts for the good of the world, and that we have great cause to thank Him for the benefits He has enabled us to confer on humanity.”

Edward Pease had distinctly forbidden a testimonial, and his friends could not, contrary to his own wishes, proceed further in that direction while he was still alive. It was, however, decided that an address should be presented

to Mr Pease in the modest and unassuming manner he so much loved, and in the same year this idea took a practical shape. On the 23d October 1859, a small party, specially chosen for the purpose out of hundreds of influential subscribers, waited on Mr Pease and presented him with the following :—

*“ To Edward Pease, of Darlington, in the County of Durham,
Esquire.*

“ SIR,—The undersigned, your friends and neighbours—in most instances the descendants of those whom you have survived—greet you with unfeigned respect, due alike to your venerable age, and the unvaried consistency of your conduct during a term far beyond the usual span of man’s existence.

“ We fondly hoped that this expression of esteem would have assumed a form more public in its character, more gratifying to ourselves, and more encouraging to posterity, than this merely individual address ; but your modesty—conspicuous at the close, as it has been a strong feature in the progress, of your eventful life—forbidding us to perpetuate your memory by a lasting testimonial, leaves us no other alternative.

“ In no period of history have so many and so important events occurred as that in which you have lived, and no one more than your self has taken so active a part in strenuously promoting whatever might develop the resources of the country in which we have the good fortune to dwell.

“ In times less enlightened and more prejudiced than these, with amazing foresight you penetrated the necessity of unbroken communication by railways, and in 1818 predicted the extension of that system which now spreads a network over the civilised world, binding nations together for the interchange of mutual interests. Not content with simply grasping the idea thus initiated, you brought an earnestness of purpose, under difficulties almost overwhelming, to stimulate your perseverance, and the success of your first project from the collieries in the west by Darlington to Stockton-upon-Tees—the ample fulfilment of your augury—is an abiding monument to you, rightly called ‘ The Father of Railways.’ Many of us, inhabitants of Darlington, reflect with gratitude that to yourself and your active colleagues, the

late Thomas Meynell and Jonathan Backhouse, we owe entirely the advantage of our town being the focus whence sprang the means of locomotion you originated; and can never forget that to your determination alone belongs the merit of continuing and increasing the manufactories of this place, which would otherwise have been abandoned for a more profitable investment of capital.

"Directly and indirectly—by your sterling ability, fertile resources of invention, inexhaustible assiduity, and the highest moral courage—you have been the means, under God—who has hidden boundless riches in the earth, but granted intellect to man for their development—of opening fresh avenues to science, encouraging every branch of trade and commerce, employing large bodies of operatives, and ameliorating the condition of all classes of society. To you, therefore, more than to any hero of any age, the thanks of a nation are due, and justly may you be termed 'A Pioneer of Peace.'

"Few men have been blessed with so numerous, and none with a more prosperous, offspring: active benevolence—personal sacrifices in distant lands on holy and peaceful missions—distinction in the Senate—a singular aptitude for business, and an untiring zeal for the welfare of others; such are the marked characteristics of your children and your grandchildren, to whom you have always been the constant exemplar and the faithful friend. May your posterity to remotest generations follow in your footsteps, and do likewise.

"Private life is delicate ground, but we are not unmindful that more than any man you enjoy the implicit confidence of your fellows; that you have foiled the subtle, assisted the weak, guided the resolute, supported the wavering, assuaged the angry, reconciled the estranged; and though now in the full maturity of age, in health and intellect marvellously, and we trust long to be preserved, you can look back upon a life of unblemished and distinguished reputation, leaving us only the regret of being denied the satisfaction of recording our sense of your services by some memorial more enduring—but no less sincere—than this simple writing.

"DARLINGTON, 23^d October 1857."

This may be said to have been the last event of anything like a public kind in which Edward Pease took part. The ceremony of laying the foundation-stone of the pedestal on which the original "Locomotion" now stands, in front of the Darlington Railway Station, took

place on the 6th of June in the same year (1857), and it was desired that Mr Pease should take the most prominent part on the interesting occasion. This, however, he was unable to do, and in lieu thereof he wrote the following letter to Mr John Dixon, the first surveyor of the company conjointly with Stephenson, and Mr Macnay, who had waited upon him to ask his consent:—

“DARLINGTON, 6th mo. 2, 1857.

“RESPECTED FRIENDS, JOHN DIXON AND THOS. MACNAY,— I have considered the request which you were deputed to make, that I should lay the foundation-stone of that building which it is proposed to erect for preserving the first locomotive engine that ever went on a public line of railway, as this did in 1825. From my very advanced age and unwillingness to enter into anything connected with public active life, I feel I must be excused accepting this mark of regard and esteem, which I cannot but appreciate, and do feel grateful in being selected for the office. Sanguine, and I may say sure, as I was of the value of railways when I first moved in their introduction with two or three able helpers, and such an engineer as the late celebrated George Stephenson (then first drawn from obscurity), their success and importance have far, very far, exceeded the most favourable anticipations, confidently sanguine as these anticipations were. With an ample repayment of satisfaction and pleasure, I cannot, in taking a retrospective view, regret the care and attention for three or four years given to the completion of our then unpopular work, opposed by magistrates, commissioners of turnpikes, &c., to the full of their power. Steady, disinterested attention, without one shilling of fee or reward, brought our work, thankless and wageless, to its completion. And it is with inexpressible satisfaction I contemplate that so large a portion of the civilised world is now reaping inestimable benefit from this mode of transit. When I see the hundreds of poor Irish reapers so quickly and easily transferred from country to country, and our beloved Queen, with her most interesting group, with so much ease, rapidity, and comfort, conveyed from Windsor to Balmoral, the sight and reflection delight me. Again declining the kindness of your proposition, I subscribe myself, with much respect, your friend,

“EDWARD PEASE.

"The abundance of my years must apologise for very much in this letter."

When he was preparing his *Life of George Stephenson*, Samuel Smiles called on Mr Pease at his residence in Darlington in the autumn of 1854. "At that time," says Smiles, "Mr Pease was in his eighty-eighth year, and yet he still possessed the hopefulness and mental vigour of a man in his prime. Hale and hearty, full of interesting reminiscences of the past, he yet entered with interest into the life of the present, and displayed a warm sympathy for all current projects calculated to render the lives of men happier. Still sound in health, his eye had not lost its brilliancy, nor his cheek its colour; and there was an elasticity in his step which younger men might have envied." He was, like all his family, very fond of horticultural pursuits, and he called the attention of Smiles to the fact in these words: "Look at these fine old trees! Every one of them has been planted by my own hand. When I was a boy I was fond of planting, and my father indulged me in my pastime. I went about with a spade in my hand, planting trees everywhere as far as you can see. They grew while I slept, and now see what a goodly array they make. But," truly added the old man eloquent, "railways are a far more extraordinary growth even than these. When I started the Stockton and Darlington Railway, some five-and-thirty years since, I was already fifty years old. Nobody could then have dreamt what railways would have grown to within one man's lifetime." *

We regret that space will not permit us to follow at much greater length the career of Mr Pease. The writer

Smiles' *Life of George Stephenson*.

does not assume to be the Boswell or the Smiles of the grand old patriarch. It may be that an adequate record of his life's work will never appear. Certainly the facilities and resources for such an undertaking are diminishing every year, and the probabilities are being discounted with them. But it would be unpardonable, even in this brief and unpretending sketch, to withhold reference to the almost Cromwellian character of the man. Mr Pease himself would probably, had he been consulted on such a matter, have been the first to utter—

“Hold ! no adulation ; 'tis the death of virtue ;”

but it would be the merest affectation to deny or ignore the fact that, in moral strength, courage, and inflexibility, Edward Pease was one

“Where every god did seem to set his seal,
To give the world assurance of a man.”

One who knew him well has given him credit for remarkable tact and penetration, allied to a tendency towards inflexible justice, which sometimes almost approached Draconic severity. But he was kind and considerate withal, hospitable and large-hearted, and would have died a much more wealthy man “but for his unbounded forgiveness of debt.”

Being one of the strictest sect of the “people called Quakers,” he was opposed to all dissension, and always advocated the interests of compromise and peace. He had no dislike to the Church of England, but he always set his face against its affectation of civil power and religious superiority. Living, as he did, long before the abolition of church rates, he resisted their imposition to the utmost of his power, and he and his friends were often,

on this account, compelled to suffer for conscience' sake. Writing to a friend on this subject in 1852, he said, "I know thou will say church rates is a legal tax. Then can a conscientious man of his *own free will* go and do that which his heart tells him is inequitable and unjust. I cannot but hope, if the Legislature does not take it out of the hands of those who are willing to tear their neighbours' goods out of their houses without a shadow of justice, that my good friend . . . will be no further participant in such matters."

In the month of July 1858, Mr Pease passed to his rest, in the ninety-second year of his age. His death was mourned in every household in the town where he had spent his busy and useful life. His funeral was very largely attended, and, in homage to his memory, business was entirely suspended. He was interred in the quiet little cemetery of the Friends in Skinnergate, where a headstone as plain and unpretentious as the man himself simply indicates his name, age, and date of decease. *Requiescat* the "Father of Railways!"

The Father of the Railway System! What more honoured or honourable title could a man possess? The man who earned for himself this distinguished appellation will live in story, if not in song, during many generations—long, very long, after the heroic and dashing achievements of those who have in their day filled a larger space in the world's eye shall have been completely obliterated by the hand of time. The triumphs of the Senate and the Forum may be relegated to the limbo of oblivion—the inherited nobility of princes and lords will be eclipsed by the breath of other kings—even the greatest names in art and literature may ultimately fade from the

memory of man, or be so far overshadowed by those of artists and authors yet unborn as to fall into unmerited neglect ; but no lapse of time and no achievements of merit can take from Edward Pease his pre-eminent distinction as the "Father of Railways." Down to the latest posterity his name may be expected to flourish in immortal youth. When the railway system has encircled the earth as with a girdle ; when "men shall learn the art of war no more," and the era of universal peace has been ushered in ; when the heroes of Sadowa, and Corunna, and Trafalgar, and Waterloo, shall be regarded by a remote posterity as the professors of a wicked and barbarous propaganda ; and when, perchance, the sun has gone down on the industrial supremacy of England, the children will still turn to the fathers and crave for the story of the "Father of Railways." Nor will the name of Edward Pease live in his own country alone. Lands that are now sunk in the deepest sloughs of ignorance and barbarism ; nations that may have nothing else in common with the land of his birth ; communities to whom the forensic, philosophical, and literary reputation of Greece and Rome is not even "as a tale that is told ;" tribes and tongues that have never articulated the great names of Nelson and Wellington, of Burke and Fox, of Pitt and Peel, may learn to remember and revere the name of Edward Pease. What a splendid destiny ! Could it ever have entered into the heart of Edward Pease—the man who humbly "dwelt among his own people," and had no thought beyond that of being permitted, while making himself useful to all around him, to follow out in obscurity the course of what, as this world goes, would be called an obscure life—that in the long hereafter his name was to

be inscribed in the long roll of those pioneers of progress whom not only his own country, but the world itself "delighteth to honour!" And yet this, and no less distinguished place in the great Walhalla of fame, is reserved for the man who successfully projected and carried out the first public railway!

JONATHAN BACKHOUSE,

THE FIRST RAILWAY BANKER.

A CONTEMPORARY writer has said that "the world's wealth is its original men ; by these and their works it is a world, and not a waste : the memory and record of what men it *bore*—this is the sum of its strength, its sacred 'property for ever,' whereby it upholds itself, and steers forward, for better or worse, through the yet undiscovered deep of time." Jonathan Backhouse was essentially an *original* man. Few subjects of biography could present greater attractions on that account. But as "the race is not always to the swift," so it happens, alas ! too often, that the men who have most deserved to live in the memory and gratitude of their fellows and of posterity are allowed to drop out of remembrance, because no effort has been made to perpetuate their achievements and character. The present memoir will, it is hoped, be a means of repairing a hitherto inexcusable blank in biographical literature, and of securing a meed of due justice to the conduct and character of a man whose lifelong career pointed a moral of the best kind, and served to remind us that "we can make *our* lives sublime."

The Backhouse family have for many years occupied a leading position in Darlington, both socially and commercially. With the remote antecedents of the family we do not care to deal. For all practical purposes, their modern his-



Jonathan Packhouse



tory may be said to date from 1774, when Mr Jonathan Backhouse, the elder, founded the Darlington Bank. This venerable gentleman, who died on the 11th of November 1826, in the eightieth year of his age, was the father of the subject of this memoir.

Of the career of the latter we have little knowledge previous to his taking an active part in the affairs of the projected Stockton and Darlington Railway. He took much interest as a young man in both agriculture and horticulture. In 1813 the Society of Arts presented him with a silver medal as an acknowledgment of his services to agriculture in planting 271,000 larches on waste grounds of which he was the proprietor.

Allusion has already been made in another place to the advocacy of the Stockton and Darlington Railway by Mr Backhouse, and to the fact that he was originally in favour of having the railway carried no farther than Darlington, a canal being considered the easiest mode of communication between that town and Stockton. It was not that Mr Backhouse had serious misgivings about the success of the railway. In this respect he quite reflected the buoyant confidence of his friend Edward Pease. But there was a strong prejudice against the railway and in favour of a canal. That prejudice could not be altogether conquered, and it seemed, therefore, as if it were necessary to the success of the proposed undertaking that it should be conciliated. It should not be forgotten that the opponents of the rail had at least colourable excuse for their predilections. Railways or tramroads worked entirely by horses had been introduced in several parts of the kingdom previous to 1818. One of these, extending from Wandsworth to Croydon, and known as the Surrey Road, had proved a notable failure.

It was urged at the time that "the rails were nearly worn out, and the shares were selling for £5 each." On the other hand, there was "confirmation strong as holy writ" that other railways of a more private character had been eminently successful. Mr Homfry, who was one of the members of Parliament for Stafford between 1812 and 1818, was asked to state his opinions respecting tramroads or railways—for the two were then regarded and spoken of as synonymous—and he declared that, "in preference to communicating with the Monmouthshire Canal at a short distance, he made a tramroad to the port, a distance of twenty-three miles, and in a direction parallel to the canal; and that while the canal paid less than 8 per cent., the tramroad paid 18 per cent." Many other proofs were available (and some have been quoted in preceding pages) to show that there was ample reason to expect a good return from the proposed railway.

But the compromise which Mr Backhouse recommended was overruled. It was determined to carry a railway the whole distance of twenty-five miles between the two intended termini—Stockton and the South Durham coal-field. Finding the practicability of the venture clearly established, and persuaded by the arguments of his co-worker, Mr Pease, the mind of Mr Backhouse did not long halt between two opinions, nor was he at all laggard in his efforts to promote the success of the scheme. As head of the then well-known and highly influential banking firm of Backhouse & Co., he had a weight and power that probably exceeded that of any other promoter, and these he exercised to the utmost to bring about the ultimate consummation of their joint endeavours. He was a fluent and effective speaker, and his wisdom and readiness in counsel had

much to do with breaking down the barriers of prejudice and ignorance, and reconciling public opinion to the impending change. At all the earlier meetings of the promoters held in Darlington between 1818 and 1821, he was present and took an active part. He was one of the most active and zealous members of the committee appointed on the 13th day of November 1818 to carry into effect the newly-projected railway; and it appears from the earliest minute-books of the Stockton and Darlington Company that at many of the committee meetings preliminary to the opening of the line in 1825 he was in the chair, and directed the course of business. Like Mr Edward Pease, however, he had not anticipated or intended the use of locomotive power, nor is there any testimony of his having discerned the eventual revolution which the locomotive was to be the instrument of bringing to pass.

It is a sensible and just remark of Jean Paul, that "as in art, so in conduct, or what we call morals, before there can be an Aristotle with his critical canons, there must be a Homer, many Homers, with their heroic performances." When we apply the canons of criticism to the conduct of Mr Backhouse, we find not a few elements of moral heroism to admire. As a banker, much would naturally be expected of him at a time when it was necessary not only to conciliate, but to educate the faith of the people towards what most of them were disposed to regard as an equivocal experiment. These expectations he appears to have largely, if not wholly realised. Everything that lay within the limits of his power he pledged himself to do in furtherance of the project. He made great efforts to secure the required capital of £124,000, a sum which, however comparatively trifling it may seem in these days, was in those representa-

tive of great resources and purchasing power, and therefore much more difficult to raise. But the confidence of the banker infected his clients; and the old ledgers of Backhouse & Co. show that at this anxious and crucial time the head of the firm did not work for the railway in vain. It may be added, that he lived long enough to see the realisation of much greater results than he ever anticipated from the railway system,—his active connection with the affairs of the Stockton and Darlington Railway being continued up to the year 1830.

In the life and labours of Mr Backhouse there are many reminiscences that may be said to have even greater general interest than his early connection with the railway system. Some of these we propose to put on record.

In the spring of 1811 he was married to Hannah Chapman Gurney, a member of the well-known Norwich family of that name. Both were members of the Society of Friends, and, in the interval between their marriage and 1830, were called to the ministry of that communion. For several years they were noted as two of the most earnest ministers of the Society in the North of England, and undertook many preaching tours together. In 1827 they spent several months in visiting Newcastle, Durham, Sunderland, and other towns, holding meetings as opportunity offered, and making house-to-house visitations, where good was likely to be done. In 1829 they undertook a journey to Ireland, with the same beneficent purpose, and in 1830 they projected a visit to North America.

The monthly meeting of the Darlington Society approved of this journey, and issued "to the yearly, quarterly, and monthly meetings of friends in America where these may

come," a certificate recommending Mr Backhouse and his wife to their "brotherly care and sympathy."

Mr Backhouse and his wife embarked for America on the 4th day of August 1830, and arrived at New York on the 1st of the following month. They found the affairs of the Friends in sad disorder. For some years previously there had been a conflict at their yearly meetings through a widespread schism, and a consequent secession. Elias Hicks, who was the leader of the secessionists, appears to have gradually imbibed opinions that nearly approximated to deism, yet masked by a specious profession of high spirituality. Many of the meeting-houses, burial-grounds, and other property of the Society were taken possession of by the seceders where they formed the more numerous party.

It was at this juncture that Jonathan Backhouse and his wife stepped in to try and repair the breach. They travelled through the greater part of North America, chiefly on horseback, preaching not unfrequently as often as three times a day. They first prosecuted their labours in the State of New York, whence they proceeded to Philadelphia, Boston, New Bedford, Nantucket, and other places.

Towards the close of 1831 Mr Backhouse and his wife found themselves crossing the Alleghany mountains. The latter makes a note of the journey, and declares that "it requires fixed attention to steer clear of stumps and keep the carriage from overturning in the ruts that the rain has made ; but we are in no real danger. All is so slow-paced that it cannot well exist." They crossed the Monongahela and the Ohio, on which they undertook a lengthy journey, preaching to the population, both white and coloured, at several points on the route, and ultimately arriving at

Cincinnati. From the latter town they took boat to Hamilton, a town on the great Miami river, and thence they proceeded to Newport, in Indiana. It was here that Mr Backhouse wrote the following interesting letter :—

“NEWPORT, MAYNE COUNTY, INDIANA,
15th of 10th month, 1831.

“MY DEAR —, We have attended the yearly meetings in Ohio and Indiana, and are now 700 or 800 miles west of New York. These two States (Ohio and Indiana) are very fine and fertile districts, and have made in forty years wonderful advances in the comforts and arts of civilised life. A great part of Ohio, within thirty years, was a wilderness, and now towns and cities and villages are to be found in various parts of it. Cincinnati alone contains 30,000 inhabitants, and on the river Ohio are several hundred steamboats, almost in constant operation, chiefly from Pittsburg to Cincinnati and New Orleans on the Mississippi. We came 350 miles, and might have gone by steam navigation 1500 miles farther. . . . Where we now are is amidst the more recent settlements, where a few fields are cleared of the trees, a small house, built with logs, and not abounding with the comforts of life. The whole family, though consisting of ten or twelve persons, all sleep in one room. We generally separate our bed, and make a little apartment for ourselves by suspending a pair of sheets at a little distance from the bed. . . . The kitchen is also the dining-room, and the loom occupies an important place in it. Here people are really clever and ingenious; they grow the wool, spin, dye, weave the cloth, and make their clothes. . . . We had a public meeting at early candlelight, and candles were even to make when the time of meeting was near at hand; but they speedily melted some tallow and had the candles ready for us. The travelling is very difficult. The roads are bad beyond description, much of them through the woods, and so often trees which have blown down have fallen across the road, that we have to turn out into almost untrodden paths, through the bushes, and often deep in the mire, that it is not only slow and tedious (not exceeding 2 or 2½ miles an hour) but very fatiguing. Here the noise is perpetual, from the croaking of frogs, the locusts called ‘Katy-did-it,’ from a constant reiteration of a sound resembling these words, and of a bird called ‘Whip-poor-will,’ from the same resemblance.

“JONATHAN BACKHOUSE.”

From this letter some idea may be formed of the difficulties and privations which Mr Backhouse and his wife endured and surmounted in following their labour of love; and yet they seldom murmured, and were never dismayed. Mention is made in Mr Backhouse's diary of a dwelling where they put up that had no other light by which to see the food on the table than what was admitted by the door being set open with the thermometer at zero! On another occasion, after a long ride over the prairies, they missed the way, and had to leave their carriage, and walk through deep snow to a miserable cabin, where they had to put up for the night. "It might be right," remarks Mrs Backhouse, "for us to be thus detained, for the next morning we visited in a neighbouring cabin a poor old woman who bore the character among her neighbours of being 'middling wicked.' She was very dirty; had a stern, dark, miserable countenance—was sitting by a log-fire muttering to herself; an opening in the wall beside her admitted the cats and the cold air. My husband (Jonathan Backhouse) read to her the story of the Jew and his daughter—the latter on her death-bed entreating her father to read the New Testament, and to speak no more against Jesus of Nazareth. The old woman was much affected, sat with her elbows on her knees, and shook her head with evident feeling." All through the winter of 1831, this devoted couple suffered voluntarily, and for the sake of the great cause to which they had consecrated their lives, vicissitudes which, but for their exceeding realism, might be assigned to the realms of romance. No danger daunted them, no terrors appalled them. Once or twice, when the thermometer was at 25 and 27 degrees below zero, they hesitated to venture over the prairies; but it would have been rash bravado to have attempted such a

thing when we are told that "water froze within three feet of a large wood-fire." During their journeyings they had their slumbers often enough disturbed by the dogs howling at the wolves; and in the absence of sufficient light in the miserable log-cabins where they had to spend many of their nights, they had to take writing materials into their close carriage and write there.

Early in 1832, Jonathan Backhouse returned to England to look after some business affairs, leaving his wife to pursue her labours in America. In December of the same year, however, he returned to the United States.

In 1834 Mr Backhouse spent some time in Ohio and Indiana, travelling principally on horseback, over roads which the hard frozen mud often rendered difficult and almost dangerous; but his courage and perseverance were equal to the occasion. In crossing the Ohio, when it was covered with floating masses of ice, he describes being landed on one of them, and having to step from one to another until he reached the opposite shore.

Deeply interesting though it is to trace the wanderings and work of the Backhouses during their subsequent residence in America, the exigencies of space demand brevity, and we can only further remark, that after following their tour through Albany, Indiana, North Carolina, South Carolina, and Tennessee, Jonathan Backhouse returned to England in March 1835, and was followed by his wife—who remained behind to fulfil some engagements in Philadelphia, Ohio, and Kentucky—in October of the same year.

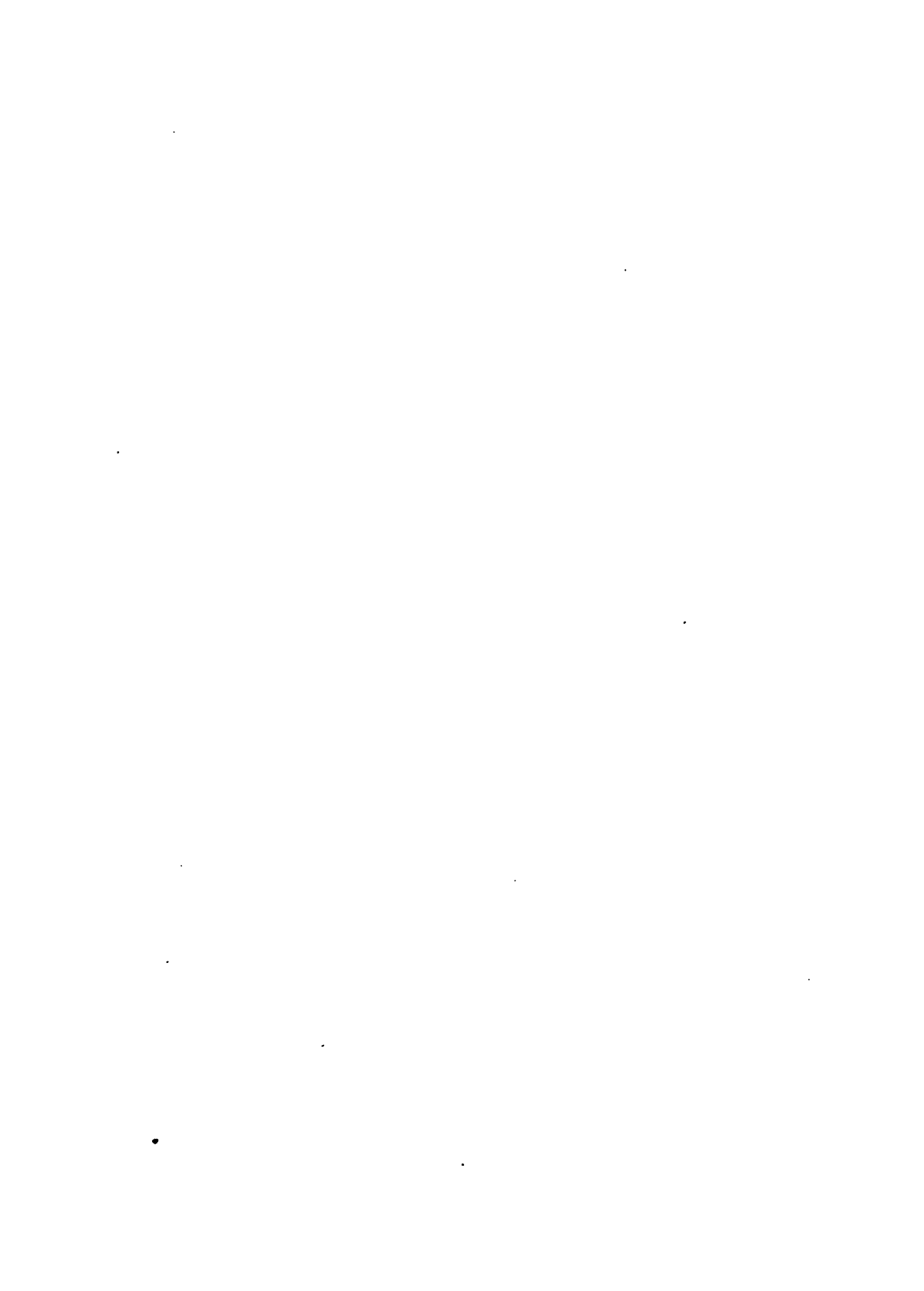
Some time after their return to England, Mr and Mrs Backhouse visited Scotland, and held meetings at Coldstream, Jedburgh, Peebles, Glasgow, Stirling, Perth, and

other places. After holding a meeting in Montrose, Jonathan Backhouse was seized with paralysis, and for some days his life appeared to be in danger, but he recovered again a fair degree of health, although never the full use of his limbs. This premonition, however, was not sent long before the event of death. On the night of the 7th of October 1842, another paralytic seizure occurred, and all was over in less than half an hour.

It is rather outside the scope of this work to introduce matters otherwise than cognate to the subject of railway development; but the latter may be described as the least remarkable feature of Mr Backhouse's career, and one, moreover, that affords but the slightest possible clue to ascertaining what manner of man he was. It was not alone as a religious propagandist that he distinguished himself. He was also an apostle of the abolitionist movement, and never ceased to lift up his voice against the crying iniquities of the system of slavery; while it has truly been remarked that "few have taken a more lively interest than he did in the protection of the aborigines of various countries from the wrongs and cruelties inflicted on them by civilised man." Riches with him were but the baggage of virtue, for in addition to the extensive and multifarious religious services in which he was engaged in England, Scotland, and Ireland, and on the continent of America, he found time to be an active and generous patron of the Bible and School Societies, as well as a labourer in the cause of the negro race.

To eulogise the life of such a man would be like gilding refined gold. His death, at the comparatively early age of sixty-four, terminated a devoted and self-denying life, and one the usefulness and value of which has never been

fairly assessed by the world at large. He is still thought of by many, and he probably may continue to be, as an eccentric member of an eccentric religious persuasion ; but he was not more "fervent in spirit" than "diligent in business," and his success in the establishment of the Stockton and Darlington Railway is only one of many undertakings he brought to a successful issue, and in which he displayed commercial talents of an exceptional kind.





Geo Stephenson

GEORGE STEPHENSON,

THE FIRST RAILWAY ENGINEER.

THE career of George Stephenson, the first railway engineer, has often been used to "point a moral and adorn a tale." He was not born great, nor had he greatness thrust upon him ; but by his own right arm he achieved the distinction to which he attained.

Born on the 9th June 1781, at a cottage close to the river Tyne, near Wylam, Northumberland, George Stephenson was the son of an engineman at Wylam Colliery. He was first employed in agricultural work, and afterwards as a "corf-batter" (that is, a lad who knocks the dirt from the corves employed in drawing the coals) at the same colliery as his father. He subsequently became a pick-carrier—that is, one who carries the miners' picks from the mouth of the pit, where they were drawn to bank, to the pick-sharper's shop, to be sharpened for future use. We next find him employed at Black Callerton Colliery, to which his father had removed, first as a gin-driver, and afterwards as a fireman. His origin and antecedents were thus of the lowliest kind.

George Stephenson's next step towards promotion was of a very humble kind. When seventeen years of age he was advanced to the position of "plugman," which involved the charge of the pit-engine, and was a grade

above that of fireman. This was at Walbottle Colliery, where, however, he did not long reside, for we find him, in 1802, employed at Wellington Quay in brakeing or working an engine which dragged the wagons, loaded with ballast taken out of the ships, from the wharf to the top of an inclined railway plane on the ballast-heap or deposit. Here, on the 28th of November 1802, he married Fanny Henderson; and here, also, on the 16th of December in the following year, his son Robert was born.

Stephenson's next removal was to Killingworth Colliery, called West Moor, where he was engaged to brake one of the winding engines. In 1808 he and two other brakesmen, Robert Wedderburn and George Dodds, contracted with the owners of the Killingworth Colliery to work the two engines drawing coals at the A and B pits of that colliery, and it was while so occupied that he accomplished the first work that removed him from obscurity. The story is a long one, but must be told here in the briefest possible space. In sinking the C and D pits at Killingworth, very large feeders of water were met with. An auxiliary Newcomen condensing engine was therefore erected to assist the main engine in drawing to bank the surplus water, which could not otherwise be raised. But this engine, proving inadequate for its destined purpose, Stephenson offered to make it pump all the water; and in spite of the jealousy and objections of Cree, the colliery engineer, Ralph Dodds, the viewer of the colliery, agreed to allow Stephenson to try his "'prentice han'" on the auxiliary engine. The Newcomen engine condensed the steam within the cylinder, the cistern containing the water for condensing the steam, called the "jackhead cistern,"

being placed at such a height above the cylinder that the pressure of the water should be greater into, when the injection valve was opened, than the pressure of the steam within the cylinder. The pressure of steam in the boiler of such engines was laid down at three pounds per square inch above atmospheric pressure. Stephenson, however, found that the boilers would sustain a greater pressure than three pounds per square inch, and raised the pressure to about seven pounds. At the same time he raised the jackhead cistern to an equivalent height, so that the pressure of the column of water should be greater than the elasticity of the steam within the cylinder; and so, when the injection-valve was opened, the water passed into the cylinder in a jet, and condensed the steam. Hence, by balancing the beam of the engine, he accomplished an increased pressure on the cylinder (which was forty-eight inches diameter) of about four pounds per square inch. He also obtained an increased number of strokes by raising the jackhead cistern, a little more than equivalent to the extra four-pound pressure of steam. Thus he obtained an increased power of about seven thousand pounds moving at the rate of 180 feet per minute; and this additional power was found sufficient to raise the extra feeders of water, and effectually drain the pit.

After this achievement, Stephenson was promoted from being a common brakesman to the position of directing engineer, and at a somewhat later date he was made sole engineer to the different collieries belonging to the owners of Killingworth, including Long Benton and Killingworth, in Northumberland; and Mount Moor, Darwent Moor, and South Moor, in Durham. In this capacity he soon displayed his genius for improve-

ment. He first applied an underground engine, then employed to pump water at Killingworth, to drag the coals up a sloping plane from the dip side of a down-cast dyke of twenty fathoms; and subsequently, on an extension of the application of fixed engines to dragging coals from the dip workings of Killingworth Colliery, two other engines were used, which, in conjunction with the original engine, conveyed the coals by sloping planes from a distance of nearly two miles, and raised the water by sliding spears from a depth of eighty-three fathoms below the level of the bottom of the pit. This was the most extensive system of engine planes underground in the trade at that time, the furthestmost engine being fifteen hundred yards distant from the pit, while the smoke of the boilers was conveyed along flues the whole distance.*

For other two notable improvements introduced at Killingworth, Stephenson was responsible. The first was the employment of tramroads, with small carriages or trams pushed by boys, on which the coals in the corves or baskets were conveyed from the extremity of the workings to the main roads, instead of using ponies with sledges, thus saving much expense. The second was the improvement of the safety-lamp. Upon the latter we shall make some remarks.

The attention of Stephenson had for a considerable time been directed to the necessity for a safety-lamp; and he received his greatest impetus in this direction from the existence of a blower, or discharge of gas, in the engine plane at Killingworth Colliery. The fresh air passed down the drift, so that the gas could be lighted at any time with impunity. Stephenson, we are told by Mr Nicholas Wood,

* Transactions of the North of England Institute of Mining Engineers.

“frequently lighted the gas, and observed, when it was lighted at a distance from the exit of the blower, that the flame took a certain time to pass from where it was lighted to the aperture of the blower, and besides, that the flame did not reach close to the aperture from which the gas issued, but, from there being a strong current of air in the drift, the flame was kept at a distance from the aperture ; and when the area of the drift opposite the blower was diminished, so as to produce a very strong current, the flame of the blower could be kept at a considerably further distance from the mouth of the blower, and on still further diminishing the area of the drift, he could drive back the flame from the orifice until the mixture of gas with the atmospheric air was not explosive, and when, in fact, the flame became extinguished.” Hereupon it occurred to Stephenson that if he could produce, through a tube admitting the air into the interior of the lamp, such a current as would keep back the flame of an explosive mixture, when ignited by the flame of the wick of the lamp, in the same manner as the current of air of the drift kept back the flame of the blower from the aperture, he would have a safety-lamp. .

After a number of experiments, carried out in the company and with the assistance of his friend Wood, Stephenson at last constructed a lamp with a tube in the bottom, through which the air was admitted into the interior of the lamp, and a chimney to produce sufficient draught of air through the tube to prevent the ignited gas from passing downwards, and furnished, moreover, with a slide to regulate the quantity of air admitted into the lamp, so as to produce a greater or less velocity, as might, by experience, be required to keep back the flame. It was found, on a

trial of this lamp, that when the slide was sufficiently closed, so that the external air, though explosive, did not, when ignited within the lamp, pass through the aperture, there was not sufficient air admitted to support combustion, and the flame of the lamp was always extinguished.

From that time to this the Stephenson lamp—or, as the pitmen like to call it, the “Geordie”—is much more generally adopted in the Northern coal-field than any other, notwithstanding that numerous lamps claiming to be of a more modern and improved kind have since then been introduced to the notice of the trade. It is found, indeed, that whatever opinions the employers may have as to the relative merits of the different safety-lamps now in use, the miners of the North have a distinct, and apparently unalterable, prejudice or predilection in favour of Stephenson’s, “their first and only love.”

At the time when Stephenson first took up the improvement of the locomotive engine, he was almost alone. After numerous experiments and much labour, he produced at Killingworth, on the 27th of July 1814, a locomotive capable of propelling itself by the adhesion of its wheels on the round top-rails. Something of the kind was then absolutely wanted. Stephenson had previously introduced tramways at Killingworth. But he knew that if he could apply locomotive power to the working of tramways, in the place of horses, it would create a very considerable difference in point of both cost and convenience. Hence he made one experiment after another, and devised one improvement after another, until he had his locomotive in regular work. Those who are curious in such matters will find a detailed account of Stephenson’s experiments and improvements in “Wood on Railways.”

Attempts have been made to detract from the originality of some of the inventions with which Stephenson's name is identified, and more especially so far as the blast in the chimney is concerned. It is claimed by Mr Hedley that "it was at Wylam, in the small chimney, that the value of the blast was ascertained, and not elsewhere;" and Mr Timothy Hackworth of Darlington has also put in a claim for the same application. But Mr Nicholas Wood has pronounced most distinctly, that "whether or not the efficient application of the blast was first adopted at Killingworth, I know that the steam from the cylinder was passed into the chimney by a pipe in the first engines tried on the Killingworth line; and as the mouth of the pipe was turned upwards, it must of necessity have acted as a blast, as from the noise made from the exit of the steam into the chimney through the pipe, the engines got the name of 'puffing billies.'" As for Mr Hackworth's blast, it was not applied to the engines on the Stockton and Darlington Railway until some years after the Killingworth engine was tried, so that he could not claim the original application of the principle.

The circumstances of Mr Stephenson's connection with the Stockton and Darlington Railway have been already placed on record in our history of that undertaking. Repetition here of the facts there stated would be more than useless.

During the time that he was employed as engineer on the Stockton and Darlington Railway, Mr Stephenson was consulted respecting the formation of a line of railway between Liverpool and Manchester. Mr James had started this project so far back as 1803, and it was revived by Mr Gay in 1822. But it was not till 1824 that it was

thoroughly taken up at the instance of Mr Saunders. After the promoters had satisfied themselves of Stephenson's suitability for their purpose, he was employed as the engineer of the Liverpool and Manchester Railway. Respecting this appointment, Mr Nicholas Wood has said:—

“Undertaking the survey, advocacy, and construction of the Liverpool and Manchester Railway was an era in the life of George Stephenson which demanded and brought into full play and prominence all the talent, indomitable perseverance, and inexhaustible resources of his clear and powerful mind. In the survey, it is well known, he had to contend against almost all the landowners on the line. In advocating the measure in Parliament, and before the public, he had the most powerful influence of the Duke of Bridgewater's Trustees, the Mersey and Irwell Navigation, and the Leeds and Liverpool Canal Companies, and a host of landowners opposed to him; and, as the system of railways was striking at the root of all the existing modes of internal communication, he had almost all the engineers of the day, as well as all the talent of the bar, arrayed against him; and as there was the Chat and Parr mosses and bogs to pass over, as well as extensive tunnels, excavations, and embankments, and viaducts to form, it is more than astonishing that one man, operating on an almost entirely new system, could face such formidable difficulties. The very attempt stamped him as a man possessed of the most comprehensive mind, and indomitable firmness and perseverance; and the manner in which he successfully combated and overcame all those difficulties, and thus ultimately changed the whole system of internal communication, and almost established a new system, which has been productive of results that even yet are not entirely developed, stamped him as the most extraordinary man of the age, or, indeed, of any age.

“The construction of the Liverpool and Manchester line of railway presented no ordinary difficulties. In addition to a long viaduct over the Sankey Valley of nine arches, fifty feet span each, and seventy feet in height above the Sankey Canal, there was a tunnel 2250 yards in length, twenty-two feet wide, and sixteen feet high, cut through red sandstone, shale, clay, and sand, with abundance of water; likewise cuttings through rock seventy feet in depth; an embankment forty-five feet in height, and in breadth at the base sixty

to 135 feet ; various bridges ; and the great Kenyon cutting of 800,000 cubic feet ; all these had to be successively encountered and overcome. But the great obstacles were two mosses or bogs, the Parr Moss and the Chat Moss, the latter so soft and fluid that an iron rod would sink through it by its own gravity, the depth being from thirty to thirty-five feet. The construction of the line across the former was intended to be accomplished by pouring upon the moss the produce of a cutting of clay, which, although it was expected to be partially swallowed up, was found in the execution that, as rapidly as the clay was thrown upon it, the whole gradually and silently disappeared, until the mass reached the bottom of the moss, and became consolidated by resting on the foundation thereof, and by the lateral pressure of the moss. Through part of the moss the embankment thus formed was twenty feet in height above the level of the moss. The greatest obstacle, however, was the great body of the Chat Moss, over which the railway was to be formed nearly upon a level, and which, from its depth and extent, could not be formed by the displacement of the moss, as in the case of the Parr Moss. All these obstacles and difficult works formed powerful grounds for the opposition against the Bill in Parliament for the construction of the line ; and supported, as it was, by the most eminent counsel of the day, was a struggle of no ordinary description, the novelty of the works proposed to overcome the difficulties forming ample scope for the ingenuity of those casuists."

A great fight took place on the question of the motive power to be employed, and the committee sat for thirty-eight days for the determination of this problem. Stephenson was examined for four consecutive days, and proved to the satisfaction of the committee that he could execute all the works for the estimate presented to them. With regard to locomotive power, he proposed to supply locomotive engines which, he stated, would convey twenty tons of light goods at the rate of eight miles an hour, and forty tons at four miles an hour, although he had no doubt they could be made to travel twelve miles an hour.

It was considered largely due to Stephenson's tact and prudence that the Liverpool and Manchester Railway

Company obtained their Act. Messrs Rennie, Cubitt, Rastrick, and Vignolles were also examined in favour of the Bill, while Messrs Giles, Leather, Wild, Smith, and Palmer were examined against it. The Bill was passed in 1826, and on the 15th September 1830 the formal opening of the line took place.

About this time, and for years afterwards, public feeling was strangely excited about the railway system. Stephenson and his son had to play their cards very carefully. He has himself stated—on the occasion of opening the Newcastle and Darlington Railway in June 1844—that when he aided in the projection of the Liverpool and Manchester line, and talked about attaining with the locomotive a speed of ten miles an hour, “some one inquired if I were a foreigner, and another hinted that I was mad!” Commercial men and men of enterprise were enthusiastically in favour of railways, and eager for their introduction all over the country; but the vested interests of roads and canals, and landed proprietors who feared their estates would be injured, together with the great body of the public, were violently prejudiced against them.* It is on record that “in every parish through which Stephenson passed, he was eyed with suspicion by the inhabitants, and not seldom menaced by violence. The aristocracy regarded the irruption as an interference with territorial rights. The humbler classes were not less exasperated, as they feared the railway movement would injure those industrial interests by which they lived. In London, journalists and pamphleteers distributed criticisms which were manifestly absurd, and prophecies which time has signally falsified.”†

* Statistical Society's Journal for 1866.

† Life of Robert Stephenson, vol. i. p. 169.

On the 26th of April 1829, the directors of the Liverpool and Manchester Railway advertised the conditions of a locomotive competition, in which they offered a premium of £500 for the best engine, not to exceed, with water, six tons in weight, and capable of a speed of ten miles an hour. Mr Stephenson's famous engine "The Rocket" was entered in this competition, and its rivals were "The Novelty," constructed by Messrs Braithwaite and Ericson, and "The Sans Pareil," constructed by Mr Timothy Hackworth of Darlington. The contest terminated in favour of Stephenson's "Rocket," which weighed four tons and three cwt., and maintained a rate of seventy miles in five hours, or fourteen miles an hour. The successful character of the contest induced the directors of the Liverpool and Manchester line to adopt locomotive power, instead of the stationary system recommended by Mr Rastrick, or the stationary reciprocating system counselled by Mr James Walker.

Shortly after the opening of the Stockton and Darlington Railway, Mr Stephenson, on the advice of Mr Edward Pease, who furnished most of the required capital, and retained a partnership in the undertaking, erected works at Newcastle for the construction and repair of locomotives. These works subsequently became, and maintained for a number of years the distinction of the largest locomotive works in the world. They are carried on successfully up to the present time.

The next railroads of which Mr Stephenson and his son Robert undertook the construction were the Canterbury and Whitetable line (opened in 1830); the Bolton and Leigh and the Leigh and Kenyon lines; the Grand Junction Railway from the Liverpool and Manchester

line to Birmingham; the Manchester and Leeds line; the London and Birmingham line; the North Midland line from Derby to Leeds; the York and North Midland, from Normanton to York; the Birmingham and Derby line; the Sheffield and Rotherham line; the Midland Counties Railway, from Rugby to Derby; the Darlington and Newcastle line; the Whitby and Pickering Railway; the Maryport and Carlisle Railway; the Chester and Crewe and the Chester and Birkenhead Railways. Mr Stephenson was also connected with the construction of several important railways on the Continent.

In recognition of the services which he rendered in the construction of railways in Belgium, Mr Stephenson was in May 1835 created a knight of the Order of Leopold by the late King of Belgium, and the honour of knighthood was on several occasions offered to him by Sir Robert Peel—an honour, however, which he persistently declined. A statue was erected in his honour in 1844 in St George's Hall, Liverpool; and in 1854 a splendid marble statue was erected to his memory in the station of the North-Western or London and Birmingham Railway in London, the subscription of 3150 workmen and 178 private friends. Another colossal statue of bronze was subsequently erected to perpetuate his achievements near the Central Station in Newcastle.

While employed in the survey of the proposed "Royal North of Spain Railway," in 1845, Mr Stephenson was seized with an illness, terminating in an attack of pleurisy, from which he never quite recovered. On the 12th of August 1848, he expired at Tapton House, Chesterfield, where he spent the sunset of his life, in the sixty-seventh year of his age.



Beane J

JOSEPH PEASE,

THE FIRST RAILWAY TREASURER.

THE story of the life of Joseph Pease introduces the reader to both the struggles and the triumphs of the Stockton and Darlington Railway. When the first meeting was held in Darlington to promote the construction of that line, he was only nineteen years of age, having been born in 1799. But the father, Edward Pease, had even at this early period of his son's life endued him with a firm and abiding faith in the advantages of railways; and young Joseph was of too ardent and sanguine a disposition to remain inactive when there was a fight to be fought or a prejudice to conquer. His interest in the railway system, and his efforts on its behalf, may therefore be said to have begun with the inauguration of the Stockton and Darlington line in 1818.

For the distinguished and prominent part which he was afterwards to take in the commercial world, Joseph Pease received from his father a suitable training. As a boy, after he had received something more than the rudiments of a sound practical education, he was inured to all the drudgery which his father deemed requisite to qualify him for making his own way in the world, having not only to begin at the foot of the ladder as a junior clerk and message-boy, but having afterwards to acquire a practical knowledge of the sorting, combing, dressing, and other

processes carried on in his father's factory. As a man, he brought forth the fruits of this early discipline, in a masterly command of all practical details and habits of steady industry.

When the Stockton and Darlington Railway was opened, Edward Pease was an old man, and the growing need of rest gradually led to his relinquishment of practical and active interest in the affairs of that line. His mantle, however, had fallen upon the shoulders of an apt and able son. Joseph Pease was formally installed in the office of treasurer to the new line, and in that position he acquired an influence in the counsels of the board of direction scarcely subordinate to that of his father. That influence he exercised with wisdom and discretion, although always on the side of progress. Both mentally and physically he had an extraordinary amount of "go" about him. This trait of his character was so reflected in all that he did, and was so supremely ascendant in the management of the first public railway, that his authority was more like that of dictator than that belonging to the comparatively subordinate function of treasurer. If a new extension was projected, Joseph Pease was consulted before anybody else. If additional rolling stock were required, Joseph Pease was invariably called upon to prescribe its kind and capacity. If an appointment of consequence had to be made, he was the man to make or recommend it. If ways and means were required, it was he who had to provide them. If difficulties arose to obscure the company's prospects, he was often the young David who went up and slew the lion that stood in the path. His power was subordinate and yet paramount. His functions were nominally defined and prescribed, and yet they were so

widely ramified as to be indefinable. He actuated all the movements of the commercial machinery; he permeated all the counsels of his ostensible superiors; and in a little railway republic he was a virtual autocrat.

We have already seen how the finances of the company flourished under Mr Pease's control. From scarcely five per cent. in the first year or two of its existence, the line soon reached the payment of seven per cent. dividend and upwards. It would be unjust to Joseph Pease, by doing him more than justice, were we to claim that the success of the company was wholly or even mainly dependent upon his efforts on its behalf. But much of that success may undoubtedly be traced to the judicious enterprise which he and his fellow-directors exhibited in projecting extensions from time to time to meet the exigencies of increasing or latent commerce, and to their skill in overcoming the early difficulties which confronted them in trying to bring traffic on to the new line.

After the opening of the Stockton and Darlington line, the far-seeing mind of Mr Pease discerned the possibilities of fostering and guiding the industrial growth of South Durham in such a way as to benefit not only his own interests, but the general trade of the district. The sphere of his operations at his father's mills was bounded by a limited demand, and by other considerations which need not here be specified. But the railway system appeared to open out a prospect of unlimited development in limitless resources. The coal trade of South Durham was then comparatively in its infancy. There are no statistics available from which we can ascertain the total vend of coals in this division of the great Northern coal-field previous to the year 1825. Data, however, can be found which enable

approximate estimates to be formed. Up to 1825, Stockton was the only port of shipment between the Wear and the Tyne on the east coast, and Carlisle, Workington, and Ulverston on the west. But even Stockton was a remote distance from the South Durham coal-field, and could not be resorted to except at a heavy cost for cartage. Hence it is not surprising to find that the first shipment of coals from Stockton did not take place until 1822. In that year 1224 tons were exported. In 1828 this quantity had advanced to 66,051 tons. For the next four years no returns are available, but we find that in 1834 the total vend of coal on the Tees had increased to 261,244 tons, and from the latter date the shipment of South Durham coals from the Tees ports increased steadily for several years. Apart from the quantity of coal shipped from Stockton, a very insignificant quantity would be raised in South Durham previous to 1825; but the conviction forced itself on the mind of Mr Pease that the advent of railways would completely alter the commercial and industrial relations of the district, and in this belief he proceeded to work.

In 1828 Mr Pease became a partner in Shildon Colliery, near Bishop Auckland. He did not commence operations on a large scale, having only acquired possession of a share held by one Thomas Longstaff. The old Shildon coals were then led by carts to a place called Thickley Spouts, near to the site of Shildon Railway Station, and from thence they were carried by rail to Stockton for shipment. The colliery was afterwards called after Queen Adelaide; and the "Adelaide's" coal continues even unto this day to enjoy a reputation scarcely inferior to the better-known "Wallsend's."

The idea of creating another port on the Tees as a rival

to Stockton originated with Joseph Pease, who made a very careful examination into all the circumstances, geographical and otherwise, of the district lying between Stockton and the sea, and came to the conclusion that better facilities for the shipment of South Durham coals could be found at Middlesbrough than elsewhere.* In pursuance of this idea, Mr Pease induced some of his friends to join him in the purchase of an estate of 500 acres of land—the site of the modern town of Middlesbrough. This land was then (1829) a dismal swamp, and seemed only to be adapted for the *habitat* of sea-fowl. But the utility of the purchase soon became apparent. In the hands of Mr Pease, the Middlesbrough estate speedily threw off its primeval habiliments. In the preceding year an Act of Parliament had been obtained for the construction of a line from Stockton to Middlesbrough. Of this line Joseph Pease was the principal promoter, and pending its construction he erected coal staithes near the site of what is now the Middlesbrough Dock. When the line was opened, therefore, there was every provision necessary to the shipment of coals on a large scale from “Pease’s port,” as it was sometimes called. It was not the least of the advantages offered by Middlesbrough that the channel of the Tees between that port and the sea was less dangerous and difficult of navigation than it was between the newly-created port and Stockton. Of this manifest advantage coal-owners and shippers did not hesitate to avail themselves. The trade of the port, founded on the sure and safe nucleus of coal, advanced from year to year towards the attainment of a magnitude that its promoters never anticipated. Its population grew larger in a

* The shipment of coals from Hartlepool did not commence until sixteen years afterwards.

ratio corresponding with its increase of trade. Capital was attracted towards it. A pottery was founded, and iron-works were established. A small and prosperous town superseded the traditional farmhouse and the half-dozen aboriginal inhabitants; and the place seemed to be in a fair way of achieving a respectable position among the ports of the north-east coast—although necessarily still a long distance behind either Newcastle or Sunderland—when the birth of the Cleveland iron trade interposed to hasten its laggard speed, and usher it on a career of progress which can only be paralleled by the marvellous stories that are told of the mushroom growth of American cities. For Joseph Pease, then, it may fairly be claimed that he was not only a pioneer of the first public railway, but also—and in this distinction he stands alone—the founder of the now populous and important town of Middlesbrough.

To attempt a full record of the industrial and mercantile career of Joseph Pease would be to swell out this memoir into the dimensions of a large volume. From the first hour of his connection with Middlesbrough, he was associated more or less intimately with all the varied schemes tending to the development of that town and its staple industry; and the hundreds of furnaces that belch forth clouds of smoke and fire, night and day, along the course of the railway, not less than the railway itself, and the annals of Middlesbrough from the moment of its inception in his fertile and prescient mind, establish a monument to his memory that time itself will not be able to obliterate. From the year 1830, he acquired one colliery after another in South Durham, until he found himself the largest and most influential coal-owner in the whole Division. At the time of his vacating his active connection with the firm of

which he was the head—and which then included his brother Henry and his five sons—their collieries were producing nearly 2,000,000 tons of coal per annum, being about one-half the total production of coal in the two counties of Northumberland and Durham when he was junior clerk in his father's office !

There is still another phase of Mr Pease's business career that must be mentioned before we proceed to speak of him in other aspects of his many-sided life. He was one of the first to realise the potential results of the discovery of the Cleveland ironstone, and the second to acquire ironstone royalties after that discovery had been established. In 1852, he and his eldest son undertook the opening out of the Hutton Low Cross and Codhill mines, to which a branch line was carried from the Middlesbrough and Guisbrough Railway. Other mines were opened out at Up-leatham, near Marske, and in the Skinningrove Valley; and it is important to register the fact that the great bulk of the ironstone raised from these mines was offered to the proprietors of blast-furnaces, or to capitalists that projected the erection of blast-furnaces, at a rate, and under conditions, which materially assisted to promote the growth of the Cleveland iron trade. In the raising of ironstone, as well as in the production of coal, the firm of J. & J. W. Pease speedily took a premier position. There is nothing more remarkable in the annals of that remarkable district than the unflagging enterprise with which they opened out one mine after another until their operations reached a scale of magnitude which is still without parallel. The quantity of iron ore raised from the mines of the firm has averaged more than a million tons per annum for the last ten years, while the total number of hands employed by

them during that period—including both collieries and ironstone mines—has approached 10,000!

In the history of his country, Mr Pease is chiefly known, and will probably be most distinctly remembered, as the first Quaker member sent to Parliament. From his youth up he was distinguished for active and earnest political sympathies, and his efforts on behalf of industrial progress, combined with his well-known energy and capacity, caused him to be singled out as the champion of the Liberal interests of South Durham after the passing of the Reform Bill of 1832. In the general election of that year he was returned for South Durham at the head of the poll, with Mr John Bowes, of Streatham Castle, as his colleague. In 1835, and again in 1837, he was returned to Parliament without a contest.

Considerable interest was taken in Mr Pease's return, outside the circle of his own immediate acquaintance, when it was known that he belonged to "the people called Quakers." That interest received a fresh impetus when the honourable member, on entering the House of Commons on Friday the 8th day of February 1833, declined to take the usual oath. The incident of his refusal, we are told—

"Had not been unanticipated, and there were those present who would fain have held this question of privilege to be an insuperable bar. Lord Althorp, however, promptly proposed the appointment of a committee to inquire into the precedents bearing on the point, and report to the House; and this course was ultimately agreed to. On the subsequent report of the committee, Mr Pease took his seat for South Durham. Henceforth he was *the* Quaker Member. He was the first member of the Society of Friends who had sat in St Stephen's, and on whose behalf the oath had been dispensed with. Had a man of less courage and resolution had his part to play on this occasion, Parliament might not have been opened to the South Durham member. We know that his determination was unflinching. From the

moment of his return, he pledged himself that he should occupy the seat. On consulting one of the highest constitutional authorities on the law as to how this was to be effected, he was counselled to petition the House to dispense with the usual oath. 'I will petition nobody,' was his instant reply; 'I am sent here according to the law of the land as representative in Parliament for South Durham, an important county constituency; and it shall never be said that South Durham in my person was brought down upon its knees to beg for its rights.' No jot or tittle of the peculiarities of 'the people called Quakers,' then more rigidly preserved than now, would he waive or surrender, so long as this principle of the independent and free representation of the county was at stake. The strict garb of the Friends, and the refusal to uncover the head to earthly rank, he continued on this occasion, even in the presence of the Speaker himself. And his sturdy resolution, as we all know, conquered. In less than a fortnight after the swearing in of the *other* members, Mr Pease figures as a speaker in the reported debates. His hat had been removed more than once in the interval, but his seat for South Durham was secured." *

During his nine years of Parliamentary life, Mr Pease made a name for himself that will not soon be forgotten. His maiden speech was made on behalf of Joseph Hume's proposal to abolish private rights in lighthouses. He proposed and carried the insertion of a clause in the Metropolitan Police Bill prohibiting the then common pastime of bear and bull-baiting. He took an active part in the Anti-Slavery movement, and materially aided the great work of Clarkson and Wilberforce. The payment of compensation to West Indian planters he opposed, "until the great measure of abolition was carried into effect." Shortly after he had entered Parliament he was appointed chairman of a committee to inquire into the subject of Colliery Ventilation; and he sat also on a committee on Church Leases, which reported to the House of Com-

* Joseph Pease : a Memoir.

mons on the 6th May 1836.* Among other subjects on which Mr Pease addressed the House, mention may be made of the amelioration of the laws inflicting capital punishment, a proposed inquiry into the causes of public distress, a condemnation of the brick duty, the necessity for a strict supervision of savings banks, the reform of the insolvent debtors' courts, the policy of continuing the malt tax as a tax on luxuries, the tithe commutation question, the grievances of Dissenters in respect to the

* In "Random Recollections of the House of Commons, by One of no Party," the following refers to Mr Pease :—

"Mr Pease, the Quaker member for Durham, is one of the most useful, though not one of the most shining, members of the House. In his attendance on his legislative duties, he is the most punctual and close of any man I ever saw. He even beats Mr Hume himself. From the beginning of the business till the adjournment, no matter how late the hour, there he is ; not, indeed, in one particular seat, but in some part or other of the House, all attention to what is going on. It is clear he acts from principle. As to a party object, he knows not what it is. A more conscientious and upright man never sat in the House.

"Mr Pease speaks pretty often, but it is chiefly in committees, or on questions which do not call up the leading members. His mode of address is, of course, different from that of other members. He never uses the word 'Sir' in addressing the Speaker, which all other members do at almost every fourth or fifth sentence ; nor does he call any member, according to the invariable practice of all other members when addressing the House, 'the honourable member,' but simply says 'the member' for such a place. In short, agreeably to the principles of the Society to which he belongs, he applies no honorary titles to any one. He speaks with great rapidity, and is never at a loss for words or ideas. His style is correct, but plain. In his manner there is no action whatever. He stands stock-still. His voice is weak, which, with his great rapidity of utterance, often renders him inaudible. He is about forty-five years of age.

— "His stature is of the middle size. His face is of an angular form, and is expressive of the mildness and intelligence for which he is distinguished. He is not a man of brilliant parts, but his judgment is remarkably sound, and he always takes the common-sense view of a subject. He is not only a man of great intelligence, but is always correct in the statements he brings to bear on any question. Take him for all in all, he is, as I observed at the outset, one of the most useful members in the House. If he is a fair specimen of the Society to which he belongs, the country would have no reason for regret were the entire 658 members selected from the Society of Friends."

marriage law and church rates, and a speech in support of a proposed Bill, by which two-thirds of the ratepayers might be enabled to tax themselves, if they so desired, for the support of public educational institutions.

The sustained and increasing pressure of commercial and private engagements induced Mr Pease in 1841 to retire from Parliamentary life. His decision on this matter, despite the remonstrances and arguments of his friends, was unalterable. His valedictory address contained the following passages :—

“Sensible that I am unequal to the fatigues and responsibilities of my present position, I could not,” he wrote, “with the views I entertain of my personal and home duties, again accept so distinguished a mark of your favour; hence the political connection which has subsisted between us, through three successive Parliaments, is about to terminate, in all probability, for ever.”

“I recur with much emotion to the period when, unaided by any man and unfettered by prejudice, you chose me as one of your representatives in the first Reformed Parliament. For a while the work of reform and good government was progressive. Many and salutary changes were accomplished. Abuses were remedied and benefits were conferred. The national expenditure was curtailed. Sinecures were abolished. Vexatious taxes were repealed. West Indian slavery was annihilated. The East Indies were thrown open to British enterprise. Commerce and manufactures were stimulated. Agriculture was cherished. Education, learning, and the social condition of the people received the fostering care of Government. Many threatening clouds, portending war and misery, were dispersed by a pacific policy. And the great cause of civil and religious liberty made visible and heart-cheering advances.

“To have heartily borne a part, the most humble, in the labours of those times, must ever afford me lively satisfaction. Latterly, however, I have seen the whole course of beneficial legislation systematically obstructed. In the heats of party contention, the true interests of an enlightened and deserving people have appeared to be lost sight of, whilst the prevalence of a spirit of religious and

political rancour has interfered with almost every proposal for the advancement of the common good, and blighted our most pleasing anticipations of the further development of a wise and Christian policy."

In the Society of Friends, to which he was always attached, Mr Pease was first an elder and afterwards a minister, and in the latter capacity he travelled over a great part of Great Britain, and addressed congregations of the Society, by appointment of the yearly meeting in London. He was also for several years the president, and for the whole period of his life the earnest and liberal supporter, of the Peace Society.

Respecting Mr Pease's private and social characteristics one of his friends has borne the following kindly testimony :—

"In the social circle it would be difficult to find Joseph Pease's equal. He was the life and soul of any party in which he might be found. His widely-extended information, on almost all subjects, however incongruous, which came upon the *tapis*, with a large fund of amusing and instructive anecdote, and a rare gift and facility in communicating these, rendered his conversational powers almost unequalled. The happy art which he possessed of making all, from peer to peasant, feel at home with him, by his wonderful power of adapting his remarks to their varying positions; the skill with which he hit upon just those topics which would be most interesting to any who happened to form part of the company; and the tact with which he found something appropriate to say to every individual member of a large company—thus bringing the most taciturn, and even the comparative cyphers of social intercourse, *en rapport* with the rest of the circle—was very striking. His extraordinary quickness of apprehension and comprehension—his ready wit—his power of saying unpleasant things pleasantly—his suavity, urbanity, and thoroughly gentlemanly and polished manners—all went to make up attractions which rendered him a fascinating companion in any party; whilst his marvellous powers of mimicry, with a memory which retained almost *verbatim* all those little circumstances and expressions which often add so much to the point and bearing of a story, rendered his anecdotal outpourings often a rich treat to all listeners."

The efforts which Mr Pease undertook, and the generosity which he displayed, on behalf of popular education, exhibit another distinguishing aspect of his character. Long before it was the fashion to advocate an Education Act, and while large employers of labour like himself were only too liable to argue, not that "'tis education forms the common mind," but that it was a dangerous thing to give education to the *proletariat*, Mr Pease had made up his mind on the subject, and never lost an opportunity of inculcating the benefits of knowledge, and the ameliorating effects of education. He contributed many thousands of pounds to aid this great cause, both in the way of supporting organisations such as the British and Foreign School Society, and in the erection and endowment of schools for his own workpeople. In 1830 he promoted the erection of the first Public Schools at Middlesbrough, in connection with the British and Foreign School Society. Between that time and the date of his decease he founded or aided in the promotion of new schools at New Marske, Saltburn, Sunnyside, Pease's West, Roddymoor, Billy Row, Crook, St Helens, Hutton, Skinningrove, Bowden Close, Waterhouses, South Church, and Middlesbrough—most of these being mainly for the benefit of those in his own employment. In Darlington he was one of the chief promoters and largest subscribers to the Albert Hill, Bridge Street, and Bank Top Schools, and in 1870 he presented to his native town, at a cost of some £5000, the Southend Schools, which afford accommodation for over six hundred scholars. In this year, also, he subscribed £3000 to the North of England Agricultural Schools, founded for the children of those who were connected with the Friends, although not members of the Society. It is only due to the members of

Mr Pease's family to add, that they have not slackened their energies in the work wherein he set before them so noble an example. Within the last two years new schools have been opened by Mr J. W. Pease, M.P., now head of the firm, at Stanley, Esh, and other mining villages; while the Gurney Pease Memorial Schools at the north end of Darlington are an enduring monument to the thoughtful liberality of another member of the family.

It was a *sine qua non* in all the educational enterprises projected or aided by Mr Pease that sectarianism should be entirely eliminated. Owing to this condition, he sometimes came into conflict with the Church; but it is almost needless to add that he never, on this account, swerved from his principle. At a recent date there were upwards of thirty salaried teachers and nearly seventy pupil-teachers in the service of the firm of which Mr Pease was the head, to say nothing of sewing-mistresses, inspectors, and other officers required for their supervision and control. It is not too much, perhaps, to ascribe to their considerate and sympathetic treatment of their workmen, in this and other matters, the fact that the Messrs Pease have had so few difficulties in regulating and harmonising their relations with their *employés*. And this leads us to add, that it was not in education alone that the late Joseph Pease was munificent. No man had more regard for the domiciliary comfort of those under his care. He was scrupulous in enforcing, as far as circumstances would allow, the observance of sanitary laws; and he encouraged his workpeople to cultivate habits of cleanliness and sobriety by the most practical, if not the only practicable, means of providing them with houses that tended towards home comfort and self-respect. Most careful also was he to remove as far

as he could the temptations to unsteady and dissipated habits. Public-houses and beer-shops were put under a ban at all his collieries and mines. In their stead, he presented the counter attraction of workmen's clubs, reading-rooms, literary institutes, or "British Workmen." Thus it sometimes happened that those who were disposed to indulge in vicious propensities had to travel a long way for their gratification. At New Marske, for example, there is a population of nearly a thousand souls, and yet there is no public-house in or within a considerable distance of the village. Other mining communities founded by Mr Pease were similarly situated. He did not believe that men could be made sober by compulsion or by Act of Parliament; but he was firmly persuaded that the morals of men, however naturally depraved, were likely to be improved by surroundings of a healthy and ennobling kind, and these he furnished in such variety and extent as to countervail the pernicious influences and attractions of the dramshop.

In the summer of 1859, while travelling on the Continent, Mr Pease felt that his eyesight was failing, and consulted Gräfe, the German oculist, at Berlin. On his return to London he submitted to the operation of iridectomy at the hands of Dr Critchett. The operation was successful to the extent of repairing his vision at the time, but some three or four years afterwards his sight again began to fail, and in 1865 he became totally blind. From this date, also, his general health gradually declined, and he relinquished, one by one, all his business and public engagements. He died on the 8th of February 1872, in the seventy-third year of his age, and was buried, near the grave of his father, in the Friends' burial-ground at Darlington.

THOMAS MEYNELL,

THE FIRST RAILWAY CHAIRMAN.

MR THOMAS MEYNELL, of Yarm, belonged to a family that had long stood in good repute in the county of Durham. He was not so intimately mixed up in all the transactions of the Stockton and Darlington Railway Company as the gentlemen whose names have already been mentioned ; but as one of the few landowners who looked favourably upon the railroad when it was first projected, and as the first chairman of the company formed for its construction, he is fairly entitled to a place among the pioneers of the first public railway.

In a letter which he wrote so far back as 15th August 1818, Mr Meynell excused himself from attending the meeting held at Darlington to promote the first public railway, and stated that, "As far as I can judge from the different documents now before the public, and every private source of information, I am most decidedly favourable to the proposal of a railroad, and shall be very happy to contribute towards obtaining further information, plans, or estimates of the expenses necessary for carrying the same into execution. . . . I cannot perceive a prospect of a canal through either line of country paying a reasonable interest to the subscribers, whereas it appears to me that a railway affords a flattering prospect of indemnifying the

proprietors, and I should be very sorry to contribute to hold out a prospect to the public calculated to induce a number of persons, ill able to bear such a loss, to embark their small capital in so wild a scheme."

In the first list of subscriptions to the intended railway, Mr Meynell's name is down for £3000. In consideration of his active interest in the company's affairs, his large and ready pecuniary assistance, and his influential position as a landowner and country gentleman, Mr Meynell was, on the 12th day of May 1821, chosen the first chairman of the new railway, and one of the committee appointed to obtain the second Act of Parliament for which the company applied.

On this committee, and on behalf of the company's affairs generally, he worked with earnestness and assiduity, until it was determined to apply for an Act to extend the line from Stockton to Middlesbrough. This extension he steadily opposed; and when, in the early part of 1828, the Act which authorised it became law, he felt so strongly upon it that he tendered his resignation as chairman of the company, remarking that he could not with propriety take a prominent part in the execution of a measure he had uniformly disapproved of. This letter was submitted to a meeting of the shareholders held shortly afterwards. That meeting thereupon passed a resolution thanking Mr Meynell for the steady and efficient support he had rendered to the service of the company, and expressing its regret "that any recent difference of opinion should have induced that gentleman to withdraw his cordial co-operation from this company, or resign an office which he filled for many years with ability in a manner satisfactory to the company and creditable to himself."

It is pleasing to be able to add, that in after-years the breach thus created was healed up, and the son of Mr Meynell was appointed to fill the same office as the sire had occupied a quarter of a century before under circumstances of so different a character.

HENRY PEASE.

IT may almost be said of Henry Pease that he acquired a knowledge of railways, and became concerned in their development, with his mother's milk. The youngest of the five sons of Edward Pease, he was hardly born in time to enable him to take an active part in the carrying out of the first public railway; but his shortcomings in that respect have been much more than compensated for by his subsequent efforts for railway development in the North.

We are not acquainted with the date at which Mr Henry Pease first began to take an active part in the affairs of the Stockton and Darlington Railway. He must, however, have done so at a very early age, and soon after the line was opened. His name is frequently to be met with in the minute-books of the company between 1830 and 1835. These references lead to the inference that he was concerned in the more practical work of direction, aiding, where it was possible to do so, in surmounting the mechanical and other difficulties which the first public railway company was continually encountering in the early part of its career. From that time until the present he has been continuously on the board of management, so that he will probably be the oldest railway director in the world.

It has been the lot of Mr Pease to do much more

than merely administer and control the affairs of already established lines. He has been a fertile organiser and a successful projector. More than any other man, he has been concerned in the later extensions of the wonderful system which his father founded while he was comparatively a child. But his name is more particularly identified with two important extensions—that from Redcar to Saltburn, and the South Durham and Lancashire Union Railway.

If it may be claimed for Edward Pease that he founded the railway system, and for Joseph Pease that he was the founder of Middlesbrough, there will be few likely to question the right of Henry Pease to be considered the founder of Saltburn-by-the-Sea. Twenty years ago that beautiful watering-place had no existence as a community. It was simply a wild, sea-beaten, and apparently sterile locality, whose picturesque situation was rendered still more picturesque by the old village of Saltburn, nestling between Cat Nab and the Hunt Cliff, as if to procure what shelter and succour it could command from the storms that were wont ever and anon to rage "from a' the airts the wind can blaw." On the site of the modern town of Saltburn there was not a single habitable dwelling, and the locality was mainly frequented by tramps, packmen, or "fisher folk." About 1856 Mr Pease was "prospecting" the district, and stumbled by accident upon Saltburn. He was struck with the commanding beauty of the spot—with its bold, massive, indented cliffs, its fine stretch of sands, its sheltered situation, its romantic inland scenery, and its general adaptability for the purposes of a watering-place. Middlesbrough was then

growing very rapidly ; Stockton was beginning to put on a "spurt" after many decades of comparative inaction ; the recently-inaugurated iron trade of Cleveland was fostering and promoting the creation of new and populous communities in all parts of the district ; and it was evident to a discerning mind that within a few years some such resort as Saltburn would come into request. Mr Pease pointed out to his fellow-directors on the Darlington Railway Board the eligibility of Saltburn for such a purpose, and the company obtained an Act for the extension of their line to Saltburn in 1858. Meanwhile it became necessary to form the nucleus of the future Brighton, and the foundation-stone of the first cottages built at New Saltburn was laid by Mr Pease. These were appropriately termed *Alpha* Cottages. They were erected for the use of men connected with the railway. But it was not enough for the company to carry the railway to Saltburn. People were little likely to be attracted to a place where there was not a single house calculated to furnish food or shelter. Such a thing might do in the backwoods of America, where squatters have special ultimate inducements to settle down on previously untrodden lands ; but in this country, and in the North of England particularly, people were not likely to be attracted to a place that had nothing to attract but the grandeur of its isolation and inhospitableness. Hence it became necessary for the company to do something more than merely extend the railway to Saltburn. They found it expedient to inaugurate a bold policy, and they commenced by building the palatial Zetland Hotel—an erection which seemed at the time to be about as much called for as the Tower

of Babel or the Pyramid of Gizeh, but which subsequent experience has shown to have been wisely conceived and energetically executed. There are few hotels out of metropolitan cities that can eclipse the Zetland, even at the present hour, for the extent of its accommodation, the excellent and substantial character of its appointments, or the efficiency of its administration. It contains more than 100 bedrooms, and cost a sum equivalent to nearly a third of the sum expended in laying out the original Stockton and Darlington Railway. The hotel, then, was the real nucleus of the modern town of Saltburn—a town that is adding very largely to its population year by year, and the attractions of which are now admittedly superior to those of any watering-place on the north-east coast.

The South Durham and Lancashire Union Railway was projected in 1856. On the 20th day of August in that year, a meeting of the promoters took place for the purpose of organising a provisional committee. The first meeting of the provisional directors was held at Kirby Stephen on the 18th day of November following. The Act of Parliament authorising the line was passed on the 13th July 1857, and the subsequent deviation Act was passed on the 1st day of August 1859. The objects of the line were stated to be :—

“ 1. To connect the ports of the German Ocean with those of the Irish Sea.

“ 2. To unite the manufacturing districts of Durham, Northumberland, and Cleveland with those of Lancashire and the west.

“ 3. To promote the development of the iron and coal trades of the east, and the iron mining and iron trade of North Lancashire and Cumberland.

“ 4. To form a main line of railway in the south-east of Westmorland.

“5. To open to the population of the east the attractions of the Lake district, and to the people of the west, the great resorts for sea-bathing on the east coast.”

The first general meeting of the shareholders was held at Darlington on the 5th day of August 1857. The first sod was cut by his Grace the Duke of Cleveland, in a field of Mr Thompson's, at Kirby Stephen, on the 25th day of August 1857. Of 337 landowners and 311 occupiers, only twenty of each expressed even formal dissent to the measure, and not one of either class appeared in Parliament, so that both Bills passed without opposition. Under the two Acts of the company the total length of line authorised was $47\frac{1}{2}$ miles, and of this length about 35 miles, extending from the junction with the Stockton and Darlington Railway at Barnard Castle, to Tebay on the Lancaster and Carlisle Railway, was opened in August 1861. On Stainmore the line attains an altitude of 1374 feet above the level of the sea—this being, if we mistake not, about the highest range taken by any railway in England. In the projection of this line, Mr Pease was one of the most active promoters of an independent company; but by the Stockton and Darlington Railway Amalgamation Act, 1862, that company was dissolved, and the line became merged in the Stockton and Darlington Railway. It is only necessary to add, that the line has been uniformly prosperous from the outset.

Before leaving what may be called the railway aspect of Mr Pease's life, it may not be out of place to state that he was instrumental in originating the movement for the celebration of the Railway Jubilee, and has been the principal agent in carrying out all the arrangements.

In the commercial affairs of his native town he has long

held a foremost place. He is the head of the firm of H. Pease and Company, by whom the woollen mills in Priestgate and Northgate are carried on; the eldest partner in the firm of J. & J. W. Pease and Company, who own so many collieries and ironstone mines in the North; and a large proprietor of lead mines in the northern dales. He was the chairman of the company by whom the South Durham ironworks were built, and it was due to him, in a large measure, that the splendid works of the Darlington Iron Company were erected at that town by Mr William Barningham. Among the many offices which he fills of a commercial character, we may particularly mention that of chairman of the Stockton and Middlesbrough Water Works Company, and that of chairman of the Weardale and Shildon Water Works Company—two large and flourishing concerns, which he has largely aided in originating and controlling, until they now take rank among the chief undertakings of their kind in the North.

But although Mr Henry Pease has shown much of the exceptional commercial talent for which his family has been distinguished, he has not altogether, nor indeed to anything like a predominating extent, given himself up to purely mercantile pursuits. He has lived a varied and eventful life as a politician, as a member of the Peace Society, as a member of the Society of Friends, as a member of a municipal corporation, as a traveller, and as a horticulturist.

His political career, although really commenced at a much earlier date, took a practical and public form in 1857, when he was returned as member for South Durham—a position which his brother Joseph had vacated voluntarily sixteen years previously, after having occupied

it for nine years. Mr Pease did not, however, gain his seat without a contest. He was opposed by Farrer (Conservative), who in the election of 1859 was returned as his colleague, *vice* Lord Harry Vane, retired. In 1865 Mr Pease voluntarily retired from active Parliamentary life, and was succeeded by his nephew, Joseph Whitwell Pease, the present esteemed member for South Durham. It will be observed, therefore, that, with the exception of the interval of sixteen years between the retirement of Joseph Pease and the election of his brother Henry, the Southern Division of Durham has been continuously represented by a member of the family since 1832.

Into the details of Mr Pease's Parliamentary career we cannot enter here; but we may observe that he particularly distinguished himself in legislation tending to the expansion of commerce, and in such measures as the Sunday Closing Bill he took a very active part. Like his brother Joseph, his voice was always lifted up against the evils of war, and wherever or whenever opportunity offered he threw his influence into the scale on behalf of peace. He was zealous in the discharge of his party duties, and we find Lord Brougham saying of him in 1858, that "a more respectable or a more useful member I will venture to say the House of Commons does not possess."

One of the most remarkable events in the career of Mr Pease was his visit to Russia in 1853, for the purpose of endeavouring to prevent the war which was then threatened between England and that country. On this mission he was accompanied by the late Joseph Sturge of Birmingham and Robert Charlton of Bristol. All three were members of the Society of Friends, at whose instance, indeed, they undertook the onerous and honourable em-

bassy. At St Petersburg they had a long interview with the Czar, who received them very kindly, shook hands with each, and introduced them to the Empress. His Imperial Majesty also pressed them to prolong their stay and pay a visit to Moscow. With reference to the immediate purpose of their mission, the Czar declared that he would not be responsible for the outbreak of war, if it should occur, as he was most anxious to maintain cordial relations between the two countries; and, as the result proved, their efforts to avoid belligerent relations were unavailing. They left St Petersburg, after taking a cordial farewell of the Court; but they had hardly crossed the Russian frontier before hostilities were actually declared. To moralise on the events of the war and its deplorably calamitous results is as far from the purpose of the writer as it would be irrelevant to the mission of this volume, but it may be remarked in passing, that if the counsels urged by Mr Pease had been acted upon, the world would have had fewer crimes to answer for, a bloody and equivocal campaign would not have brought the blight of desolation on thousands of happy homes, and each of the nations concerned would have been better and richer than they are to-day.

Shortly afterwards, Mr Pease, accompanied by Mr Henry Richards, the secretary of the Peace Society, and Joseph Cooper of London, paid a visit to Paris for the purpose of urging the late Emperor of the French to use his influence in calling together a congress of European nations to promote the interests of peace. The Emperor received the deputation very graciously at the Tuileries, approved of their objects, and assured them of his cordial sympathy therewith; but the proposed congress did not then

come to pass, for reasons which His Majesty could not control.

With a mind ever on the quest of knowledge, and the true instinct of a traveller, Mr Pease in 1856 paid a visit to the United States of America, where he made a sojourn of three months. While there, he had opportunities afforded him of meeting some of the principal senators, and of studying to the best advantage the character of American institutions.

The remainder of our sketch must be very brief. Mr Pease was elected the first mayor of Darlington on the incorporation of that town in 1867, and he held the office for two consecutive years, enjoying a high degree of popularity, and furnishing to the deliberations of the new council that high and dignified tone which is so essentially a part of his own nature. He has distinguished himself more than any other gentleman in Darlington or its neighbourhood for his horticultural taste, and his gardens at South Pierremont are hardly to be rivalled at Chatsworth or Studley Royal. Like his father before him, he has a remarkable love of trees, among other adjuncts of nature unadorned, and he has spent much money in beautifying some of the principal thoroughfares in the neighbourhood of Darlington by planting them in such a way as will, in the course of a few years, give the roads the appearance of boulevards. Since the death of his brother Joseph he has acted as president of the Peace Society; and he is intimately connected with numerous other organisations of a moral, religious, and educational kind.

FRANCIS MEWBURN,

THE FIRST RAILWAY SOLICITOR.

AN interesting and eventful career, and one also of rare usefulness, was that of Francis Mewburn. Born in Newcastle-upon-Tyne, he was educated at Ormesby, near to the modern town of Middlesbrough, which, at that time, was represented only by the traditional farmhouse. After serving his articles as a solicitor with Francis Smales of Durham, Mr Mewburn came to Darlington in 1809, and commenced business as an attorney. Between that time and the agitation which culminated in the projection of the Stockton and Darlington Railway, he had attained a high position in his profession, and as the leading solicitor in Darlington he was naturally consulted by the promoters of the new line. Mr Mewburn's discernment was sufficiently acute to enable him to realise the value and possible ultimate importance of railways. He therefore placed his services unreservedly at the disposal of Edward Pease and Jonathan Backhouse, and aided them in all their efforts for the triumph of their novel scheme. In the session of 1819 he was in London for weeks together, interviewing and persuading all who could bring any influence to operate in favour of the proposed railway, vindicating its usefulness, answering and upsetting objections against its practicability and its alleged pernicious consequences to the landed interest, trying to raise the ways and means, which were not over-abundant,

and generally endeavouring to crush the opposition that was arrayed against the scheme. In the session of 1821, he underwent the same ordeal, and with more success. He had the gratification of finding his efforts crowned by the passing of the first Act for the construction of a public railway—an Act which he himself was mainly concerned in drawing up, and an Act which stands to this day, and will yet stand for many days to come, as a monument to the legal acumen, tact, knowledge, and industry of its framer.

Until the year 1828 there were ostensibly two solicitors to the Stockton and Darlington Railway. In that responsible office Mr Mewburn was, for the first ten years of its existence, associated with the late Leonard Raisbeck of Stockton. But Mr Raisbeck's appointment, like his duties, was little else than honorary and nominal. It seems, indeed, to have been made from motives of expediency, and chiefly with the view of conciliating the people of Stockton, who had great confidence in Raisbeck, and were largely influenced by his judgment. But it was at Darlington, and in Mr Mewburn's office, that the legal machinery of the concern was actuated, and that gentleman was the chief source of motive power. Mr Raisbeck's first and last duty appeared to be that of taking care that Stockton was duly cared for. Mr Mewburn's obligations covered a much wider area, and embraced the assimilation and reconciliation of all the various and varied interests within the company's jurisdiction. That his labours were eminently successful is sufficiently attested by the high degree of prosperity which the company attained during the forty-two years he acted as its solicitor.

On the 28th May 1828, Mr Raisbeck resigned his joint appointment of solicitor to the company for the same cause

as that assigned by Mr Meynell—the extension of the line from Stockton to Middlesbrough. The resignation was accepted, and the directors passed a resolution requesting Mr Mewburn “to continue his efficient services as solicitor,” and offering him “the warm and grateful thanks of the company for his unwearied and invariable exertions for the promotion of its interests on all occasions, especially during his late arduous though successful exertions before Parliament.”

From this time until the year 1860, when he retired from business, Mr Mewburn continued to act as the sole professional adviser of the railway, for whose very existence he had been compelled to fight perhaps the greatest battle of his life. During this long interval of active service he prepared and obtained the Acts for some of the most important extensions of the Stockton and Darlington Railway—often in the teeth of formidable opposition; always under circumstances that demanded professional dexterity, and involved more or less difficult manipulation. On receiving Mr Mewburn’s letter of resignation, the board of directors agreed upon a minute recording their unfeigned regret, collectively and individually, at his retirement, and assuring him that they were not “forgetful of the energy, ability, and success with which the Stockton and Darlington Railway Company’s interests committed to his professional care were ever watched over and secured, even in days when, standing as it were alone before the community as a railway solicitor, new practice and precedents were of necessity to be created.”

From 1846 until the incorporation of the borough of Darlington in 1867—when the office was abolished—Mr Mewburn was chief bailiff of Darlington, and in that

capacity was associated intimately with all the municipal affairs of the town. On the 17th August 1855, he was presented by Mr Joseph Pease, on behalf of 224 subscribers, with a service of plate costing upwards of £400, "as a testimonial of his high character, his zealous and honourable discharge of his profession during a period of nearly fifty years, and their esteem for him as a neighbour and a gentleman."

In this brief and necessarily imperfect sketch of Mr Mewburn's life, we cannot venture to travel far beyond the record of his railway connection. To speak of him in relation to all the multifarious offices which he filled, and all the varied phases of his active career, would nearly be tantamount to writing a history of Darlington for the greater part of the present century. No one filled a more conspicuous place in the annals of the town during that period. No one was a more complete epitome of the shrewd lawyer, the kindly and thoughtful philanthropist, the active man of business, the embodiment of municipal authority, the learned *savant*, and the social reformer. He served Darlington well in his day and generation, and Darlington acknowledged her obligation by a public funeral—by pæans of grief and requiems of sorrow—such as she has seldom accorded to one of her sons.

JOHN DIXON.

THE name of John Dixon has more than once appeared in these pages. It was he who assisted Stephenson in making the survey of the original Stockton and Darlington Railway, and it was to his charge that most of the practical details of that important undertaking were committed.

John Dixon was one of a remarkable family. He was the grandson of that George Dixon of Cockfield who took such an active part in the South Durham Canal project of 1767, and of whom we are told—

“The first attempt to make a canal was by the late Mr George Dixon, upwards of fifty years since, to carry coals from Cockfield Fell Colliery (which he rented of the Earl of Darlington) by a small canal, without a lock, to the top of Raby Bank, near Keverstone, and then to convey them in wagons down an inclined plane to the foot of the bank, the loaded wagons to draw up the empty ones. From the foot of the bank the coals were to be conveyed in another canal without a lock to near the top of Grant Bank, where they were to be taken up by the carts from Yorkshire that came over Piersebridge and Winston, &c. He cut a short piece of canal upon Cockfield Fell, and had a flat-bottomed boat upon it, to prove to the late Earl of Darlington the practicability of the scheme; but his Lordship refusing to advance any money, the scheme was abandoned. The next attempt was projected by some spirited merchants and traders of Stockton and Darlington to make a canal from Stockton to Staindrop, with branches to the bridges of Yarm, Croft, Piersebridge, and Winston. A sum of £861 was subscribed for defraying the expense of surveys, &c.”*

Of this George Dixon we are further informed by the

* Bailey's Durham, 1810.

historian Hutchinson, that "employed in the North in various coal-works and other mine adventures, he displayed an extensive knowledge and competent judgment." He and his brother were "two of the most ingenious men of the age. Mr Jeremiah Dixon, a Quaker, was educated in mathematics by Mr John Kipling, of Barnard Castle" (who was also George Dixon's master), "and figured in a public character, being sent by the Royal Society [in 1769] to the island of St Helena" (Bencoolen, Sumatra), "to observe the transit of Venus. He was employed to set the limits and bounds of the provinces of Maryland and Pennsylvania, and measured a degree of longitude. He was also the inventor of several useful machines used about the coal-works."

"It is not," says a recent writer,* "the lot of every man to write his name in a country's history. But this has been the fortune of Jeremiah Dixon. Besides his other services to the United States, he assisted in making a mark on the American continent which perpetuates his memory. In Wheeler's 'Dictionary of Noted Names' occurs 'Mason and Dixon's Line'—'a name,' says the author, 'given to the southern boundary line separating the Free State of Pennsylvania from the former Slave States of Maryland and Virginia. It lies in latitude 39 deg. 43 min. 26·3 sec., and was run, with the exception of about twenty-two miles, by Charles Mason and Jeremiah Dixon, two English mathematicians and surveyors, between November 15, 1763, and December 26, 1767. During the excited debate in Congress in 1820, on the question of excluding slavery from Missouri, the eccentric John Randolph of Roanoke made great use of this phrase, which was caught up and re-echoed by every newspaper in the land, and thus gained a proverbial celebrity, which it still retains."

John Dixon, with whom we have here to deal as a pioneer of the railway system, was born in Cockfield in 1796, where his father was a coal-owner. The Cockfield

* *Newcastle Weekly Chronicle*, 1875.

Colliery was sold, while John was still a youth, to Jonathan Backhouse, with whom he was collaterally related. John then came into Darlington, and began his business career as a clerk in the bank of Backhouse & Company. From thence he was transferred, at the instance of Jonathan Backhouse, to the service of the railway company, then being originated—first in the capacity of a clerk, and afterwards as a surveyor. In the latter capacity he assisted George Stephenson to make his survey of the Stockton and Darlington line in 1821. At that time civil engineering was scarcely recognised as a distinct profession, and surveyors found little to do outside the making of turnpike roads. It has, indeed, been claimed for Stephenson that he was the first civil engineer, and if this claim is well founded, it will only be doing justice to John Dixon to say that he was the second. Such bridges as had been erected up to 1825 were constructed either by architects or by millwrights. We find from the early correspondence relative to the Stockton and Darlington Railway that Benoni of Durham was the architect employed to construct the first railway bridge at Darlington, and we believe it is asserted that the first railway “skew” bridge—that crossing the River Tees at Croft—was the work of a carpenter or millwright. John Dixon, therefore, had practically to lay the foundations of his own profession, and to methodise and apply, if not to discover, the formulæ which guide the principal operations of the civil engineer. Modest and unassuming to a fault, he did not take the position that was his due, and his memory will probably live only as that of the man to whom George Stephenson was indebted for needed aid in a crucial emergency. But Dixon rendered to Stephenson a degree of help which will

probably never be adequately recognised by posterity. He made an elaborate series of experiments with locomotives at an early stage in their history, and the results of those experiments did much to help forward the work of railways. He could never be persuaded to allow his name to be attached to a record of his experiments for public use and circulation; but he consented to the issuing of a pamphlet, in which the principal of them were set forth, for the use of his friends.

About 1827 Mr Dixon left the service of the Stockton and Darlington Railway Company, and entered upon the difficult work of surveying Chat Moss, for the then newly projected line between Liverpool and Manchester. In the carrying out of the work he encountered many formidable obstacles. Opposition was offered to the surveying party on every hand. They were not only forbidden to carry on the survey, but they were menaced with personal violence. Failing to accomplish their purpose by fair and open means, they were compelled to resort to stratagem. Parties of game-watchers, farm labourers, or "roughs," equal to any emergency, were kept on the alert, night and day, to prevent the survey from being completed. These parties were so vigilant and active that it was impossible to elude their observation. A *ruse* was therefore attempted, which achieved the desired end. The surveying party was formed into two divisions. One division was despatched in a direction where they were certain to be challenged and thwarted by the men on the watch; and while they were apparently endeavouring to adjust the theodolite, and carry out the survey in spite of the opposition which had meanwhile confronted them, the other party, whose movements

were disregarded because of their apparent unconcern, quietly stepped in and took the levels in the right direction. The difficulties of this survey were not confined to the facing of opposition. Chat Moss was then dreary, inhospitable, and thinly populated. The surveying party resided with an old woman whose quarters were none of the best; yet these might have been tolerated by men whose arduous labours throughout the day enabled them to purchase "tired nature's sweet restorer" without the aid of a lullaby. But the victualling was simply atrocious, and Mr Dixon had many curious reminiscences regarding his hardships on this score. Bacon and eggs and eggs and bacon appeared on the table morning, noon, and night, with unvarying monotony. One day, when Dixon and his friends came in for dinner, he happened, well knowing what was to be the bill of fare, to ask the old lady what she had for them. "O Mr Dixon," she replied, "I've got bacon, and eggs, and sic like." "Well, my good woman," said he, "we've had bacon and eggs so long that we'll now try a little of the 'sic like.'" What form was taken by the "sic like," or whether it ever was forthcoming, deponent knoweth not.

Mr Dixon returned to the service of the Stockton and Darlington Railway Company in 1845, and from then until the time of his death he occupied the position of their consulting engineer. After his death, which occurred at his residence, Belle Vue, Darlington, on the 10th of October 1865, in the sixty-eighth year of his age, the directors of the company placed on their minutes a memorandum which bore that "Mr Dixon, as a pupil of the late Mr George Stephenson, was employed in the laying out and formation of this line of railway as early as 1821. Sub-

sequently entrusted by Mr Stephenson with the difficult works over Chat Moss, required in the construction of the Liverpool and Manchester and Liverpool Railway, he was afterwards engineer for several other lines of railway, and returned to this place about the year 1845, since which period he has occupied the position of consulting engineer. The board now makes this brief record, sensible of the loss it has sustained in the death of an able and experienced officer, indefatigably devoted to the interests of the company, ever performing his duties with a gentlemanly bearing and sterling integrity, which won for him the respect and friendship not only of the directors, but also of a wide circle of coadjutors and friends."

TIMOTHY HACKWORTH

WAS one of the first locomotive engineers, and became identified at an early date with the fortunes of the Stockton and Darlington Railway. Under date of the 13th May 1825, we find in the minutes of the committee of management the following record of his appointment:—
“John Dixon reports that he has arranged with Timothy Hackworth to come and settle on the line, particularly to have the superintendence of the permanent and locomotive engines. The preliminary arrangement as regards salary is £150 per annum, the company to find a house, and pay for his house-rent and fire.”

From this date until his death, Hackworth was more or less mixed up in the affairs of the first public railway. At the locomotive works at Shildon he built the “Royal George,” said to be the first engine with the steam-blast. Two years later he built the “Sans Pareil,” which entered for competition on the 6th October 1829 for the premium of £500 offered by the Liverpool and Manchester Railway Company for the best locomotive engine. When the “Sans Pareil” was examined, it was found not to have been built in accordance with the conditions laid down by the company, and it was in consequence disqualified from taking the prize, which fell to George Stephenson’s “Rocket.”

Locomotive engineering owes more to Timothy Hackworth, after George Stephenson, than to any other man.

He entered upon the duties of a locomotive engineer under circumstances of great difficulty and discouragement. Skilled artisans were then few in number and difficult to obtain. Machinery for turning and fitting had not been brought to anything like its present perfection, and the work was consequently of a rude and imperfect kind ; while it was also necessary to construct the early locomotives of slender materials. The "Sans Pareil" was a marvel of mechanism considering the conditions under which it was made. It was sold to the Bolton Railway Company, after it had done some service elsewhere, and gave great satisfaction.

Hackworth next designed engines of a different class, such as the "Majestic," the "Coronation," "William IV.," and the "Northumberland." These were chiefly built at Newcastle. It was in these engines that Hackworth first applied a large number of small copper tubes, thus greatly increasing the area of heating surface. The stroke was also shortened, and the engine was made more compact with side-cylinders.

Further improvements were made by Hackworth in the "Director," "Lord Brougham," "Darlington," "Adelaide," "Earl Grey," "Lord Durham," and "Wilberforce." Each of these was fitted with return copper tubes, affording a still greater area of heating surface.

After he had been for some years in the employment of the Stockton and Darlington Railway Company, Hackworth built the Soho Works at Shildon, which he carried on until the time of his death, and where he made a number of engines that still run on that or other lines.

DIVISION III.



THE BIRTHPLACE OF THE RAILWAY
SYSTEM.

THE BIRTHPLACE OF THE RAILWAY SYSTEM.

DARLINGTON is fairly entitled to claim the honour of being the birthplace of the railway system. It is quite true that an iron tramroad or railway was in use at Colebrookdale so far back as the year 1760; that another iron tramway was, towards the close of the last century, laid from the collieries near Derby to that town; that another was constructed near Ashby-de-la-Zouch, with four miles of double and eight of single rail; that an "edge railway" was introduced at the slate-quarries of Lord Penrhyn, in Caermarthenshire, also in the eighteenth century; and that in the year 1811 there were in South Wales no fewer than one hundred and eighty miles of railway completed.* But all these lines, and the lines spoken of in the preceding part of this work as having been projected for colliery purposes in the North of England, could hardly claim to be railways in the generally accepted sense of the term. They were lines of rail, undoubtedly, but they were formed solely for the purpose of assisting the horses in carrying heavy loads for long distances. Nor is it fair to assign the credit of first proposing a "general iron railway, or land steam-conveyance, to supersede the necessity of

* Our Iron Roads, by F. S. Williams.

horses in all public vehicles," to Mr Thomas Gray—as some have erroneously done—seeing that the publication of his work on that subject did not take place until 1820, while the scheme of a public railway had long previously been under consideration in the North.

As the birthplace of the railway system, Darlington stands unrivalled and alone. It was in Darlington that the scheme was first mooted. It was in Darlington that it was brought to maturity. It was in Darlington that all the opposition to the project was conciliated or conquered. Darlington supplied nearly all the ways and means. Darlington furnished the sinews of war for Parliamentary victory; every commercial and mechanical problem was solved at Darlington; and, in a word, Darlington, and Darlington only, was the cradle of the system which has now attained its jubilee year, after passing through untold vicissitudes, and ultimately reaching the full stature of robust and vigorous maturity. It may be claimed that the rank and credit here assigned to Darlington belongs in part to the neighbouring town of Stockton. Facts, however, scarcely seem to warrant such a conclusion. It will be remembered that the canal scheme found favour in Stockton, even more than that of the railway; and the promoters of the latter project had not a little difficulty in conciliating the opposition that was threatened from the rival scheme. It was, indeed, mainly for the purpose of conciliating Stockton—a kind of sop to Cerberus—that the name of that town was allowed priority in the designation of the new line, and not because Stockton had contributed resources towards the undertaking entitling her to that distinction. From first to last, the town of Stockton had only a very limited pecuniary interest in the scheme. Three-fourths of the capital, and more than three-fourths of the risk and responsibility were

undertaken in and through Darlington. Need more be said, then, to vindicate the claim of that town to be considered the birthplace of the railway? We wot not.

The antiquity of Darlington is very remote. Longstaff has found the earliest mention of the name between 1003 and 1016, when Ethelred the Unready, Archbishop Wulstan, Bishop Aldhune of Durham, and Styr, son of Ulphus, met at York, and the donation of the manor, with its dependencies, was made to St Cuthbert, "with a heavy curse on all who should violate the patrimony of the saint." On the 16th April 1291, Edward I. dated a summons at "Derlyngton" to fifty-seven of his military tenants of the northern counties; and the same monarch, in March 1302, dated here an instrument addressed to the Pope, and directing ambassadors to treat with him. In 1336, we find King Edward III. dating from Darlington a licence to John Gros, of Berwick, to assign property to Tynemouth Priory. When, in 1346, David of Scotland made an incursion in the North of England, "he appointed to preserve foure tounes onely from burning, to witte, Hexham, Corbridge, Darlington, and Durham, to the end he might in them lay up such store of vitayles," as should sustain his army. During the "Rising of the North," in 1569, Sussex wrote to Sir George Bowes, from York, that he heard that sixty of the Earl's horsemen were to lodge at Darlington; while the Council at York wrote to the Queen that they had ordered 2500 footmen to be at "Darneton" on the 21st. About 481 joined this rebellion in the Darlington ward, of whom 99 were executed. In the civil wars of the fifteenth century, Darlington played no unimportant part, and we find that in 1656 "the commissioners for securing the peace of the Commonwealth" were sitting at Darlington, "decimating estates, and playing havoc among delinquents."

Situated on the course of the great line of road from London to Berwick-on-Tweed, Darlington was necessarily a place much frequented by travellers in the days of the old stage-coach ; and in the troublous times that preceded the Restoration, as well as in the events of the subsequent Rebellion of 1745, it was the scene of many a stirring incident.

At an earlier date than most of the towns which now surround it, Darlington was noted for its industry. A writer in the *Universal Magazine* of 1749 spoke of it as "the most noted town in the whole world for the manufacture of linen of the sort called *huckaback*, so much used for tablecloths and napkins, being made from a half-ell to three yards wide, and the price from 7d. per yard to 18s. Great quantities are sent yearly to London, the broad sort being made nowhere else in England. There is also fine plain *linnen* cloth made to 7s. 6d. per yard, and a large woollen manufactory carried on there. At present it is a thriving place." In 1789, Gough mentions the dwellings in Darlington at about 1200, and adds that "the manufacture of small wares has lately been set at work." Towards the latter part of the eighteenth century there was a considerable business carried on in "checked tammys ;" and in the building now known as the "Low Mill," belonging to Messrs Henry Pease & Company, spectacles were made "in almost countless numbers, and sent to Birmingham and other places." It may not be generally known that Darlington lays claim to being the first place where flax was spun by machinery. A member of the Society of Friends, named John Kendrew, having in the course of his travels in Lancashire seen the spinning-jenny used for spinning cotton, conceived the notion of applying the principle of the machine to the spinning of flax. With the

assistance of Jonathan Backhouse, Kendrew and a coadjutor named Porteous, patented, in 1787, a set of machines for the preparation and spinning of flax. When these machines had been got fairly into operation, they caused some noise in the mechanical world, and Mr John Marshall of Leeds, founder of the well-known manufacturing firm of that name, came to Darlington to see Kendrew's appliances, for the right to use which he bargained to pay so much per spindle. Porteous and Kendrew carried on the manufacture of flax in Darlington for a number of years, "buying the line and tow from the hecklers in the neighbourhood, and manufacturing it into yarns, which, though at the beginning were, perhaps, no better than those made by the common hand-wheel, were produced in greater abundance and at less expense." *

Bailey, in 1810, speaks of Darlington as "having long been famous for its manufacture of huckaback diapers, and sheeting, which employ about 500 looms. It has also a worsted manufactory of camblets, wildbores, bombazets, and tammies, or durants; the two latter are spun by hand, the former by machines; in these are employed 300 looms, 100 combers, and 500 spinners by hand, besides a considerable quantity being sent into Scotland to spin. Mr Pease alone has paid £800 a year for spinning in Scotland. It was here that mills for spinning flax were first invented by the ingenious Mr John Kendrew and Mr Porteous. Of those mills there are four, and one for spinning worsted; here are also mills for dressing chamois-leather, and for grinding and polishing spectacles."

At one time, according to Longstaff, there were 1500 looms in operation in Darlington. Since the introduction of steam machinery this aspect of its industry has been

* Ord's History of Cleveland.

completely altered. The mills of Messrs H. Pease & Company are still, however, of very large extent—the largest probably of their kind between Leeds and Glasgow. Of the origin of these mills we know but little. That they were in active operation in the last century can be easily proved, and it is equally well authenticated that it was in these mills that the now opulent families of Backhouse and Pease laid the foundations of their commercial prosperity. It was here, also, that Edward Pease was employed when he projected the Stockton and Darlington Railway; here that Joseph Pease made himself acquainted with the routine of business, and qualified himself for taking the first commercial position in the North of England; here that Henry Pease, the only surviving member of the family of Edward Pease, served his junior curriculum of business; and here, also, that the industrial reputation of Darlington was maintained in years long gone by. “In the great Exhibition of 1851,” says Longstaff, “the material of the flags which from the exterior of the Crystal Palace fluttered a welcome to all was made here by Messrs Pease & Company; the very iron was smelted by Pease’s coke; Mr Pease’s firebricks gained a prize; patent fuel made at Middlesbrough, a council medal; and the Coburg cloth, manufactured here by Henry Pease & Company, carried away a prize against Halifax competitors.”

At the present time, the mills of Messrs H. Pease & Company consist of two or three very large mills at the bottom of Priestgate, and another mill in Northgate, the Low Mill in the Lead Yard having been abandoned within the last twelve months. The firm afford employment to about 700 hands, 170 of whom are males, and 530 of whom are females. These mills contain 12,224 spinning and 5408 doubling spindles. Of these numbers it may be re-

marked, that 500 doubling and 800 spinning spindles have been added within the last eighteen months by the erection of the large mill on the north side of Priestgate. The preparing, combing, drawing, spinning, and doubling processes are carried on in the Priestgate mills, and the new mills on the north side of that street are mainly reserved for carding, although they are so constructed as to be utilised for a certain amount of spinning and doubling. The mill in Northgate is used for weaving only. In this mill, when the last census of looms was taken, there were 190 working and 80 standing, making a total of 270. The total engine-power of the combined mills is equal to that of 700 horses, being just about one horse power for every hand employed. The mills as a whole are equal to the production of 10,000 to 15,000 yards of yarn per week. The staple articles manufactured are two folds and forties for the Bradford export trade, and coloured yarns for Glasgow. The firm have two agencies in Bradford, two in London, one in Norwich, and one in Glasgow. The new mills in Priestgate are considered to be as well arranged as any in the country, while the mills as a whole have few rivals for size among establishments of the same kind. The managing partner is Mr H. F. Pease, the Mayor of Darlington.

Having existed, if not from time immemorial, at any rate for a period far beyond the memory of the oldest inhabitant, the Priestgate mills were tolerated by the inhabitants of Darlington as a necessary and unpreventable institution. But it required a long process of education to teach the inhabitants of that town that they should cultivate industrial development in other directions. Darlington was always a pretty town; the inhabitants were aware of the fact; and as they were anxious to preserve its beauty untarnished, they were careful to avoid affording encour-

agement to any who proposed to offend æsthetic sensibilities by planting foundries or factories within range of contaminating the atmosphere. The first ironworks established in Darlington were founded by Cowans, Sheldon, & Company, of Carlisle, in the early part of 1854. These gentlemen proposed to enter into negotiations with the late Mr John Pease for the purchase of land from him for the erection of a forge. But Mr Pease declined to sell land for any such purpose, on the ground that there was a feeling in Darlington against having the atmosphere vitiated by manufactures, and he would not be the first to introduce such a nuisance into his native town. An acre of land was afterwards purchased at Albert Hill from the Darlington Land Company, and there the works were built—at first in a modest way, by the erection of only two helve hammers. This was the limit of the establishment for some years, until the increased demand for large forgings induced the company, in 1858, to add a three-ton steam hammer to their other plant. Since then the works have been increased from time to time, and they are now among the largest of their kind in the United Kingdom. They cover an area of six acres of land, and consist mainly of a forge with nine steam hammers, varying from one to seven tons, and capable of producing forgings from 1 cwt. to 25 or 30 tons in one piece; and a machine shop 300 feet in length by 75 feet in width, and fitted with the heaviest and best make of heavy lathes, slotting and boring machines, necessary for finishing crank shafts, and all other kinds of heavy forgings required for large marine, stationary, or locomotive engines. The Darlington Forge Company have made a *specialité* of wrought-iron railway wheels, from three to seven feet in diameter. It may be remarked that these works are capable of turning out more work than any other

establishment of the same kind in England, and have gained a reputation that is not confined to the British Isles. Their staple business consists in manufacturing from scrap-iron and finishing by machinery all kinds of forgings, such as railway buffers, draw hooks, locomotive and wagon axles, stationary engines, shafts, connecting and piston rods, marine engine crank and screw shafts of the largest size, and heavy screw frames, rudder frames, and keels for vessels of all descriptions, or of any size. The works afford employment to 300 to 400 hands. Mr William Putnam is managing director, and Mr John Hodgson, secretary.

THE SOUTH DURHAM IRONWORKS were the next in the field. Their foundation-stone was laid in the early part of 1854 by Mr Robert Henry Allan of Blackwell Hall, on whose estate they were situated. The promoters of the concern were Henry Pease, John Hardcastle Bowman, Thomas Macnay, John Harris, J. B. Pease, J. Buckton, George Harker, Alfred Kitching, R. Thompson, and W. Thompson, with James Smith as manager. Land to the extent of six acres was purchased by the company, and in the first week of January 1855 the first furnace was put in blast. It was fifty feet in height, fifteen feet diameter, and was supplied with blast by two engines, each of fifty horse power, built by Messrs Gilkes, Wilson, & Co. of Middlesbrough. It was calculated that the first furnace was equal to a production of one hundred and fifty tons of foundry, or two hundred tons of forge iron per week. The ceremony of tapping the first furnace in blast was performed by Mr Henry Pease, the chairman of the company; and the proprietors, together with a number of invited guests, after-

wards partook of a *déjeuner* at the King's Head Hotel. Another furnace was in the same year (1855) put in blast, and subsequently two others. Like all the early furnaces built in the North of England, those of the South Durham Iron Company were reconstructed and raised to a much higher altitude, besides having their cubical capacity largely increased. At the present time, they form one of the best blast-furnace plants in the North of England. The manager of the works, since they were transferred some years ago to the Limited Liability Company by whom they are now owned, has been Captain Osborne.

THE WORKS OF THE DARLINGTON IRON COMPANY (Limited) at Albert Hill were begun by Mr William Barningham in 1858, and started in February 1859. The land he acquired for their site only cost £300 an acre in 1854, whereas ground in the same locality has recently been sold for £1000 an acre. After fixing upon the site of his intended works, Mr Barningham attended the sale of the fixtures appertaining to the Manchester Exhibition of 1852, and bought the cast-iron roof that covered the Exhibition for a very low price. The same roof still covers the Albert Hill Works, and is remarkably well adapted for its purpose. Travellers on the main line of the North-Eastern system between York and Newcastle must have noticed with surprise these ponderous and yet elegant-looking works on the left hand, while the more recently built Springfield Works are on the other. Both are thus in immediate contiguity to the North-Eastern main line, which may almost be said to run through their centre. In the Albert Hill Works there are 105 puddling and 40 mill furnaces available for use. There

are likewise four finishing mills and two forge trains, each with an engine of its own. Attached to each of the finishing mills there is a blooming mill, so placed as to secure the greatest facility and economy of work. One finishing mill has 20-inch rolls, and is worked by a vertical engine with a 42-inch cylinder. The other finishing mills are worked by horizontal engines attached to each. Another 18-inch mill is driven by a horizontal engine with a 42-inch cylinder, and two 12-inch forge trains have each a separate engine with a 20-inch cylinder. The two forge trains are of 24 inches and 20 inches respectively, the former actuated by a horizontal engine with a 36-inch cylinder, and the latter by the same kind of engine with a 30-inch cylinder. The size of each of the two blooming mills attached to the finishing rail-mills is 20 inches, and each is fitted with rolls for the purpose of flattening the crop ends of rails, after being cut at the saws. The Springfield Works are devoted solely to the manufacture of puddled bars, and contain ninety-two furnaces, seven steam hammers, and two 24-inch forge mill trains, each with an engine attached. The general arrangement of the Springfield Works is carried out with admirable skill, and a proper discrimination of economical subserviency. From these works the puddled bars are carried by locomotives, owned by the company, to the Albert Hill Works, close at hand, where they are manufactured into rails. The company do not produce anything else on a large scale except iron rails, but of this commodity they probably manufacture more than any other firm in England. Previous to the transfer of the works from Mr William Barningham, their founder, to the company by whom they are now owned, their annual produce of iron rails was about 70,000 tons, and as much as £865,000

has been turned over in a single year. But even with this enormous yield the productive resources of the works were not taxed to their full extent, for they were estimated by competent men three years ago to be capable of producing over 100,000 tons of rails per annum, although this figure has never yet been reached in any one year. The total number of men and boys employed at the Darlington Ironworks when in full operation is nearly 2000. Mr Thomas Barningham is managing director, and Mr Robert Wilson, secretary.

THE NORTH ROAD LOCOMOTIVE ENGINE WORKS are of later date than any of the other works enumerated. They were projected in 1863, under the auspices of the Stockton and Darlington Railway Company, although Messrs William Bouch and David Dale carried them on in the interests of that corporation. It is not too much to say that they are rivalled by few locomotive works in the North of England for extent, and by none in the kingdom for order and symmetry of arrangement. Originally constructed on a much larger scale than the Shildon Engine Works, at the town of that name, which they were intended largely to supersede, they have attained to the rank of producing nearly the whole of the engines required for the purposes of the Stockton and Darlington Railway, while they have turned out some of the largest and handsomest engines that ever were built. The works, as now constructed, consist of seven spans, each 40 feet in breadth, by 120 yards in length. There are three six-ton cranes, supplied by Sampson Moore, each having two crabs on, and the mechanical arrangements are such that it is no unusual thing to lift an engine of thirty to forty tons weight in six minutes. The whole of the shops are well lighted and

ventilated from the roof, while the floors are all boarded, except that of the smithy. The whole of the machines are painted a lavender colour, which gives them a light and agreeable appearance, and the walls are scrupulously white-washed. The main shafting throughout the works is from $4\frac{1}{2}$ to 5 inches diameter, coupled with metal couplings. The shafting is all turned and polished, and runs in brass plumber blocks, supplied with a patent chain for the purpose of lubricating the journals. The offices of the works have a frontage to North Road of 150 yards; and the works as a whole cover an area of rather over four acres. A round "stable" is attached to the works behind, capable of containing twenty-four of the largest engines, and furnished with a turn-table in the centre, which allows of any one engine being got out without interfering with the others. This turn-table communicates with a line of rails which runs right through the main building. Engines of the very largest size are built at this establishment; and it is a testimony to their merits that the goods engines turned out have not unfrequently run for eighteen months without repairs. The works employ over a thousand hands.

THE SKERNE IRONWORKS lie on the east side of the North-Eastern main line, with which they are in direct communication. They were built in 1863, from the designs and under the superintendence of the engineering partner, Mr Edward Hutchinson, and opened early in 1864. They then consisted of two plate-mills with 23" train, one puddling-mill, and 40 puddling and heating furnaces. The works and buildings cover an area of about twelve acres, whilst upwards of eleven acres are in reserve for future extensions. The original partners consisted of Edwin L. Pease, Henry Fell Pease (the present Mayor of Darlington),

Joseph B. Pease, Walter Pease, Edward Hutchinson, and W. I. Ledward. The manufacture of plates for ship, bridge, and boiler purposes is carried on to a considerable extent, and iron is despatched, both by rail and by sea (from the Tees), to the various shipyards and engineering establishments both in the United Kingdom and abroad. The plates manufactured at these works have been used on the Thames, Mersey, and Wear, in the construction of vessels for H. M. Navy. The average output of all qualities of plates for the first few years was about two hundred and forty tons weekly, but of late years this production has been greatly increased. In 1872 the Skerne Works passed into the hands of new proprietors, and they are now known as the property of The Skerne Ironworks Company Limited, by whom their operations have been considerably extended. At the present time the establishment embraces three plate-mills, one puddling-mill, and more than eighty puddling and heating furnaces, capable of producing upwards of 30,000 tons of finished plates per annum. Upwards of 32,000 tons of pig-iron and 60,000 tons of coals are used every year, and the wages paid have ranged for some years past from £50,000 to £70,000 annually. The Skerne Iron Company are extensively engaged in the manufacture of wrought-iron bridge-work, and, besides supplying the principal home railways, they have carried out numerous contracts under foreign Governments and railway companies. Large quantities of work have been despatched to India, Australia, New Zealand, Sweden, Spain, Denmark, and other countries. When the whole establishment is in full operation, employment is given to about eight hundred men and boys. The managing directors are Mr Edward Hutchinson and Mr Pratt; the practical manager being Mr Percy Gibson.

Having now catalogued some of the principal industrial establishments in Darlington, it remains for us to notice more briefly two or three of the minor concerns. These comprise the wagon-building works of Messrs Wilson & Williamson at Albert Hill, where all kinds of rolling stock in the form of wagons are turned out; the adjoining foundry of the Messrs Summerson; the ironworks and foundry of Messrs Charles I'Anson & Son; the foundry of Messrs Lister & Son, &c. It will be apparent that Darlington is not a town of mean account in its industrial aspects, and its importance in this respect is likely to increase largely from year to year. Even at the present time, large wagon works are about to be built by Messrs Claye & Son of Derby, and very large additions are proposed to be made to the North Road Engine Works.

Prominent notice has here been given to the commercial and industrial aspects of Darlington, because these aspects are more particularly associated with the immediate subject of this work. As the proximate result of the establishment of the various works mentioned, Darlington has grown largely and rapidly in wealth and importance. In 1801 the population of Darlington township was only 4670, the total number of inhabited houses being 864. In 1831, the population was 8574, and the number of houses had advanced to 1231, so that the town had nearly doubled in population in the first thirty years of the present century. In 1841, the population stood at 11,033, and in 1851 it was 12,452. Between 1851 and 1871 the population had more than doubled, the census of the latter year having returned it at 27,730; and the present population is estimated approximately at 35,000, a large accretion of population and trade having taken place within the last four years.

We cannot enter at greater length into the vital statistics of Darlington, nor will our space permit us to deal with the social, religious, and educational aspects of the town. Briefly, we may add, that it is governed by a mayor and corporation, under a charter which was only got in 1867 ; that it was one of the four Tees-side boroughs enfranchised under the Reform Act of that year ; that it is known far and wide as the head centre of Quakerdom within the British dominions ; that its educational appliances and prestige are in advance of any other industrial town in the North, the school accommodation having long been in excess of the actual requirements of the population ; that its salubrity is attested by an exceptionally low adult death rate ; and that its environs are distinguished by exceptional prettiness.

From the commencement of the career of the Stockton and Darlington Railway, the latter town has been the centre of its operations. The first meetings of the company were held in an inn kept by one Richard Scott, who was afterwards one of the principal carriers on the line. About 1832, however, they undertook the construction of offices of their own, which were eventually matured into the present admirable suite of buildings in Northgate. Here the local committee, left in the management of the Stockton and Darlington Railway under the Amalgamation Act of 1863, are accustomed to hold their meetings, and adjudicate on all the various interests connected with the line. The mineral offices of the company are near to the North Road Station, and at that station are the head offices of the passenger department.

APPENDIX.

I.

CALCULATION OF PROBABLE REVENUE FROM RAILWAY IN 1818.

THE following is a hitherto unpublished estimate, prepared under the auspices of the original committee, of the revenue expected to be earned by the proposed Stockton and Darlington Railway in 1818 :—

Burtree gate lets for	£360	0	0	per annum
Call the gateman's profit	50	0	0	„
	<hr/>			
	410	0	0	
Deduct 2s. per day for toll taken on all articles, coal excepted, is	36	10	0	
	<hr/>			
	£373	10	0	is
Divided by 3, being the toll paid by each cart, is	179,280	halfpence		
	<hr/>			
	59,760	carts		
Deduct for double tolls for 5 months, during which time but $\frac{1}{3}$ the summer quantity of coals pass,	4150	cart loads		
	<hr/>			
	55,610	cart loads		
Deduct $\frac{1}{8}$ for what a cart carries less than a ton,	6951	cart loads		
	<hr/>			
Carry forward,	48,659	tons		
	<hr/>			
		T		

Brought forward,	48,659 tons
Deduct $\frac{1}{10}$ for the extra tolls, which carts having more horses than one pay,	4865 tons
	<hr/> 43,794 tons
At three halfpence per mile,	3
	<hr/> 131,382 halfpence
For 16 miles, from the pits to Darlington, is	16
	<hr/> 2,102,112 halfpence
Or,	£4379 0 0 revenue to be expected on coals between the western pits and Darlington.
The quantity of coals drawn at Black Boy Pit, &c., is, say 10,000 tons, 15 miles at $1\frac{1}{2}$ d., is	
	<hr/> £937 0 0
Leggs Crossgate lets for	£140 0 0
Gatekeeper's profit,	50 0 0
	<hr/> £190 0 0
Tolls received, coal excepted,	10 0 0
	<hr/> £180 0 0
Divided by 3, is	86,400 halfpence
	<hr/> 28,800 carts
Deduct for 5 months double tolls $\frac{1}{8}$ the summer quantity,	2000 cart loads
	<hr/> 26,800
Deduct $\frac{1}{8}$ for carts carrying less than one ton,	3350 cart loads
	<hr/> 23,450 tons
Deduct $\frac{1}{10}$ for what carts with two or more horses pay extra,	2345
	<hr/> 21,105 tons
	3 halfpence per mile
Carry forward,	<hr/> 63,315

Probable Revenue from Railway, 1818. 291

Brought forward,	63,315	12 miles from the
	<hr/>	pits
	759,780	halfpence is
	<hr/>	
	£1582 0 0	part of the
revenue to be expected on the Piersebridge line.		
Piersebridge gate lets for . . .	£550 0 0	
Gatekeeper's profit, . . .	50 0 0	
	<hr/>	
	£600 0 0	
Toll taken except on coal, one-sixth,	100 0 0	
	<hr/>	
	£500 0 0	
Divided by 2, being the toll on each		
cart, is	120,000	pence
	<hr/>	
	60,000	carts
Deduct $\frac{1}{8}$ for carts carrying less than		
one ton each,	55,834	
	<hr/>	
Deduct for winter tolls on $\frac{1}{8}$ the		
summer quantity for 5 months, .	6979	carts
	<hr/>	
	48,855	tons
Deduct $\frac{1}{8}$ for carts carrying less		
than one ton each,	6106	
	<hr/>	
	42,749	tons
Deduct for what passes through		
Leggs Crossgate, which also		
comes through this gate, . . .	21,105	
	<hr/>	
	21,649	
	3	halfpence
	<hr/>	
	64,947	
	12	miles from pit
	<hr/>	
	779,364	halfpence is
	£1623 0 0	
Revenue at Leggs Crossgate, . .	1582 0 0	
	<hr/>	
	£3205 0 0	total to be ex-
pected for coals on the Piersebridge branch.		

32,000 tons of coals from the pits to Stockton, which are not included in the above estimate, because they evade the turnpikes by going through Shildon, Aycliffe, Stainton, 31 miles at $1\frac{1}{2}$ d.,	£6200	0	0
Revenue to be expected between pits and Darlington,	4379	0	0
Revenue to be expected at Piersebridge branch,	3205	0	0
Revenue on 32,000 tons of coals to Stockton, 31 miles at $1\frac{1}{2}$ d. per mile per ton,	6200	0	0
Revenue on 10,000 tons from Black Boy to Darlington, 15 miles, at $1\frac{1}{2}$ d. per ton per mile,	937	0	0
Revenue on 6000 tons merchandise between Darlington and Stockton, 15 miles, at 2d.,	750	0	0
Revenue on 1000 tons merchandise, the whole length, <i>i.e.</i> , 25 miles, at 2d.,	875	0	0
Revenue on 4000 tons of lead for 30 miles, at $1\frac{1}{2}$ d.,	750	0	0
Revenue on 5000 tons of lime to Yarm, &c., 21 miles, at $1\frac{1}{2}$ d.,	656	0	0
Revenue on 17,000 tons of coals to Yarm, 15 miles, at $1\frac{1}{2}$ d.,	1487	0	0
Revenue on 1000 tons of lime to Darlington, 7 miles, at $1\frac{1}{2}$ d.,	43	0	0
Revenue on 10,000 tons of coals from Darlington to Croft, 4 miles, at $1\frac{1}{2}$ d.,	250	0	0
	<u>£19,532</u>	<u>0</u>	<u>0</u>

II.

FORMAL AGREEMENT OF SHAREHOLDERS IN 1818.

WE, whose names are hereunto subscribed, do mutually agree with each other to pay the several sums set opposite to our respective names, for the purpose of constructing a rail or tramway, from Stockton, by way of Darlington, to the collieries and the interior of the county of Durham, such sums to be paid by instalments, not exceeding £10 per cent., and at intervals of not less than three months between each other:—

Thomas Meynell, Yarm, .	£3000	Brought forward, £24,700	
Jonathan Backhouse, jun.,		Rev. W. A. Fountaine,	
Darlington,	5000	Middleton,	500
William Chaytor, Croft, .	3000	Mary Pease, jun., Dar-	
George Overton, South		lington,	100
Wales,	2000	William Cudworth, Dar-	
Leonard Raisbeck, Stock-		lington,	300
ton,	1000	Jos. Pease, jun., Darlington,	100
Edward Pease, Darlington,	1000	John R. Fenwicke, Durham,	300
William Consett, Brawith,	500	George Middleton, Dar-	
Richard Miles, Yarm, .	500	lington,	100
J. Cairns, Yarm, . . .	5000	John Spence, Yarm, . .	100
R. W. Pierse, Thimbleby,	500	H. Wigham, do., . .	100
Fra. Mewburn, Darlington,	300	Jos. Procter, do., . .	100
John Baxter, Darlington, .	500	J. Ward Sanders, Yarm, .	500
Robert Botcherby & Coy.,		Chris. Stonehouse, do., .	100
Darlington,	200	Thomas Miles, do., . .	100
Matthew Scotson, Haugh-		John Heslop, Bownton, .	100
ton,	100	Matt. Wadeson, Stockton, .	100
John Pease, Darlington, .	100	Chris. T. W. Dove, Dar-	
Edward Backhouse, Dar-		lington,	100
lington,	2000	H. Hardinge, Stanhope, .	200
Carry forward, £24,700			
			£27,600

Brought forward, £27,600	Brought forward, £76,400
W. Aldane, Leeds, . . . 200	Richd. Blanchard, Esq., . . . 2000
T. B. Pease, do., . . . 500	Northallerton, . . . 2000
John Davison, Darlington, . . . 100	Miss Peacock, Danby Hill, . . . 200
John I'Anson, jun., do., . . . 200	Miss E. Storey, . . . 500
R. Pickersgill, do., . . . 100	Arthur Sherwood, . . . 100
John Bland, Esq., Brough, . . . 500	Thos. Allan, . . . 100
John Mewburn, Whitby, . . . 100	Thos. Richardson (addl. subscription), . . . 5000
Thos. Clark, Darlington, . . . 200	Rev. W. N. Darnell, Stockton, . . . 100
John Taylor, do., . . . 100	Richard Stott, Darlington, . . . 100
Sam. Crompton, Esq., Woodend, . . . 1000	Benjn. Flounders, Esq., . . . 5000
Charles B. Hamilton, Archdeacon of Cleveland, . . . 300	Wm. Richmond, Stockton, . . . 200
Messrs H. Newman & Brothers, London, . . . 3000	Wm. Skinner, Whitby, . . . 1000
Richard Jackson, Stockton, . . . 500	Jon. Sanders, do., . . . 1700
James Procter (additional subscription), . . . 200	Jon. Sanders, for Geo. Sanders, Whitby, . . . 500
Cuthbert Wigham (additional subscription), . . . 100	Henry Belcher, Esq., Whitby, . . . 100
Lawrence Ridsdale . . . 100	Miss Skinner, do., . . . 200
Thos. B. Pease (additional subscription), . . . 500	John Holt, do., . . . 500
Wm. Aldane (additional subscription), . . . 300	Henry Simpson, do., . . . 1000
Alex. Greenhill, Esq., of Van, . . . 100	Rd. Kirby, do., . . . 100
Edward Pease (additional subscription), . . . 4000	Wm. Holt, Stockton, . . . 500
Jos. Gurney, Esq., Norwich, . . . 14,000	Geo. Lockwood, do., . . . 100
Edwd. and W. Backhouse (add. subscription), . . . 3000	Wm. I'Anson, London, . . . 3000
Wm. Chaytor, do., . . . 3000	S. Bevan, do., . . . 500
Thos. Richardson, London, . . . 5000	Saml. Gurney, do., . . . 3000
John Kitching, . . . 3000	Wm. I'Anson, Darlington, . . . 800
Thos. Meynell (addl. subscription), . . . 2000	Wm. Cudworth, do., . . . 300
Captain Milbanke, Blackwell, . . . 600	Rd. Stamper (addl. subscription), . . . 100
Jon. Backhouse (additional subscription), . . . 5000	John Wilkinson, Stockton, . . . 500
Wm. Stamper, Darlington, . . . 500	Wm. Braithwaite, do., . . . 100
Richard Stamper, Blackwell, . . . 500	John Richardson, do., . . . 100
Arthur Thistlewaite, . . . 100	Harrison Chiltor, Whitby, . . . 500
	Wm. Skinner, jun., Stockton, . . . 500
	Wm. Watson, do., . . . 100
	Moss & Wilson, do., . . . 100
	Wm. Jameson, Whitby, . . . 500
	Wm. Greenside, do., . . . 500
	Geo. Langborne, do., . . . 500
	Andw. Sanders, do., . . . 300
	John Langborne, do., . . . 500
	Wm. Gent, Stockton, . . . 100
Carry forward, £76,400	Carry forward, £107,400

Formal Agreement of Shareholders in 1818. 295

Brought forward, £107,400	Brought forward, £109,600
B. Bald, Stockton, . 100	Edmund Newby, Stockton, 100
Thomas Eeles, do., . 100	Rev. D. M. Peacock, Stain-
Wm. Sleigh, do., . 100	ton, 1000
Mathew Gibson, Stockton, 500	W. Copeland, London, . 1000
G. & W. Wilkinson, do., . 100	Jas. & J. Backhouse, Dar-
John Richardson (Roper),	lington, 3000
Stockton, 100	Thos. Backhouse, do., . 3000
Geo. Ramsden, Stockton, . 100	Henry Clark, Guisbrough, 200
John Lumley, do., . 500	John Jos. Gurney, . . 2000
Chris. Harburn, do., . 100	William Kitching, junr.,
Robert Stevenson, junr.,	Darlington, . . . 500
Whitby, 100	Thos. Miles, Yarm, . . 200
Miss Stevenson, Whitby, . 100	Todd, Watt, & Co., Stockton, 200
John Wardell, jun., Whitby, 100	John Allison, . . . 100
Nathl. Langborne, do., 200	
	<u>£120,900</u>
Carry forward, £109,600	

III.

REPORT ON FINANCE, &c., BY JOSEPH PEASE, IN 1826.

DARLINGTON, *5th mo.*, 30, 1826.

MY DEAR FATHER,—As I apprehend the principal strength of our railway proprietors are now in London, I feel anxious that they should meet and deliberately enter into the state of the concern, not only that they may have through the means of those from this district every explanation of the state of affairs, but that by your joint labours means may be devised to relieve the company from some portion of that pecuniary embarrassment with which you are so well acquainted. I annex a rough statement of the accounts of the company: it is correct as regards everything but that minuteness which the short notice I have given our clerks of requiring such an abstract prevents their entering into; hence it will appear that the concern is at present in receipt of an income more than equal to its expenditure, and perhaps when it is considered that it is but in its infancy, having been in operation but seven months; that sundry expenses are incurred at the outset of such an undertaking which never afterwards occur; that every part of a line of railway is maintained during the first year at nearly double the expense of succeeding ones; and that the company has been under the necessity of keeping down all their tolls and charges till the existing prejudices of the public are overcome and the whole traffic of the district brought on to the line, perhaps this view of the state of the concern is by no means a discourag-

ing one. In looking forward to that increase of trade and revenue which the committee so confidently anticipate, perhaps it is but reasonable to allude to the grounds on which such expectations are founded. The coal at first brought to market by the railway was of inferior quality, both as relates to condition and size; this subject has had due notice, and finer samples than are now exposed cannot be met with, which has given general satisfaction to the public, and already sensibly increased the company's revenue. In passing through so extensive a district of coal, it was impossible to approach every owner's liberty; hence there continues a considerable opposition in the market from those collieries which, by reducing their prices exceedingly low, are struggling to compete with the advantages of those whose access to the railway is easy and less expensive. The committee are satisfied that this cannot continue to be the case, as the lessees of those disadvantageously situated may continue their sales at low prices for a while so as to save a portion of the rent to be paid to the owners, yet nothing but loss must follow any attempts to force sales at their present prices. A great proportion of the farmers continue to lead their coals twenty miles and upwards by their own teams. This the committee ascribe to prejudice, and to an idea which has generally prevailed that by thus employing an opportunity when the services of their men and horses are not so much wanted, they save nearly the whole of the toll levied by the company on their way; but the committee has great reason to believe that many acting under such impression already see its fallacy, and will gradually discontinue the practice in taking their coals most advantageously to the company at the extremes of their lines. The irregularity of the supply at the commencement may also be considered as having encouraged the continuance of this habit. A large district of country in the North Riding of Yorkshire, hitherto supplied either by very ordinary coal, or by some brought at a great expense from the West Riding of Yorkshire,

is now likely to be wholly supplied from Darlington, Stockton, and Yarm, particularly from Stockton, for a distance of twenty or thirty miles, and landed on the coast within the port of Stockton, thus saving the duties. Arrangements are already in great forwardness for securing this branch of the coal trade.

The exporting of coal to London has proceeded to a considerable extent; the committee have, however, reason to believe that it has hitherto been conducted without those advantages to the merchant which alone can insure its continuance. Many circumstances, beyond the power of the company to control, have recently depreciated the price of coal in London and the southern markets. The committee, however, cannot but look forward to such a change as will increase the export of coals brought by the railway to the river Tees to no inconsiderable extent, and at remunerating prices. There are, it must be acknowledged, several local disadvantages to surmount, which the committee by no means overlook or neglect, and they feel anxious that every one interested in this railway may be solicited to extend their support to this branch of the business by using and recommending Tees coal, which will be found on trial equal, if not superior, to any that is produced in the kingdom.

In limestone, &c., there is a progressively increasing traffic—in the former especially, which promises to become a very important source of revenue. The merchandise, lead, &c., conveyed along the line, has nearly been doubled within the last month. The conveyance of passengers is another source of revenue, which, though comparatively trifling, seems likely to produce several hundreds. At first an agreement was entered into reserving the licence for the vehicles of this description to one individual; that is now rescinded, and many persons are likely to engage in running coaches daily along the line at a toll of three-pence per mile each way. One individual has paid the company £16 per month, for the last two months, on

this head, and derived very great personal advantages to himself, though only charging a penny per mile to the public, for capital accommodation, travelling at the rate of eight miles and upwards per hour. There are also several branch railroads which the committee would gladly have proceeded to complete, being convinced they would materially benefit the main line; but their solicitude to do this has been overruled by the present difficulty of obtaining the necessary advances of money.

On the whole, the committee have proceeded very satisfactorily in the discharge of duties which, whether regarded with reference to their importance to the public, their trust to the proprietors in general, or their own labour and exertions, have been very far from light. It has been through many difficulties, and with much patience and toil, that a few of the shareholders have brought the concern to the present stage of activity. The principles agreed upon at the commencement of the company have been kept in view—a regard to economy on the part of its directors, and a strict attention to keeping down the number—and have already tended to preserve the unanimity and concord of the company. This has, however, compelled the borrowing of large sums of money, as inserted in the statement herewith. Some of the lenders, to the amount of £30,000, request the repayment of their loan. Nothing has been spared to obtain a change of hands for the company's bonds successfully: it also becomes an imperative duty on the proprietors to lift the floating debt, amounting to about £10,000, and the country subscribers call upon the other subscribers deliberately to consider the best means of meeting these engagements, and placing the whole undertaking upon a permanent and most prosperous basis. The hopes of the committee are still sanguine that the Stockton and Darlington Railway will, ere long, be a concern of the first importance, not only dispensing great benefits to the district through which it passes, but amply remunerating those who have long and steadily watched over its execution.

**AN ACCOUNT OF MONEY BORROWED BY THE STOCKTON
AND DARLINGTON RAILWAY COMPANY.**

Gurney & Company, Loan,	.	.	.	£40,000
Richardson, Overend, & Company, Loan,	.	.	.	20,000
Edward Pease,	do.	.	.	895
Thomas Richardson,	do.	.	.	10,000
Joseph Pease, jun.,	do.	.	.	1,200
Robert Byers,	do.	.	.	1,000
Phoebe Ransom,	do.	.	.	500
Stephen York,	do.	.	.	600
William Kitching,	do.	.	.	1,000
Thomas Hardy,	do.	.	.	1,000
Balance due to the Treasurer,	.	.	.	10,000
Sundry debts,	.	.	.	£5000
Robert Stephenson & Company (for engines),	.	.	.	5000
Bishop of Durham,	.	.	.	5000
			<u>15,000</u>	
				£101,895
To amount of subscriptions,	.	.	.	67,500
			<u>169,395</u>	
Total amount of expenditure,				<u>£169,395</u>

ESTIMATE OF EXPENSES FOR THE FIRST YEAR.

Interest on money borrowed,	.	.	.	£4,800
Workmen employed on the way, 25 miles, at £50 per				
mile,	.	.	.	1,250
Salaries,	.	.	.	1,000
Repairs and contingencies,	.	.	.	2,000
Sundry new work to complete,	.	.	.	2,000
Leading and engines,	.	.	.	3,700
			<u>£14,750</u>	

ESTIMATE OF REVENUE FOR THE FIRST YEAR.

Twelve months, averaging £1300 per month,	.	<u>£15,600</u>
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IV.

AMALGAMATION OF STOCKTON AND DARLINGTON AND NORTH-EASTERN RAILWAYS.

THE Act for the amalgamation of the Stockton and Darlington Railway with the North-Eastern received the Royal Assent on the 13th July 1863. At that time the total authorised capital of the North-Eastern Railway Company was £22,290,059, 10s., being less than one-half their present capital. The total authorised capital of the Stockton and Darlington Railway Company was £4,051,000. The Act provided for the constitution of a committee of directors, who should regulate the ordinary affairs of the company independently of the North-Eastern Railway Board, under certain restrictions as to the extent of their authority. Under this Act, moreover, the separate revenue accounts of the different sections of the North-Eastern Railway were fixed in the following proportions :—

To the Berwick section,	44'10
To the York section,	25'41
To the Leeds section,	7'72
To the Malton section,	0'29
To the Carlisle section,	8'58
To the Darlington section,	13'90
	<hr/>
	100.00
	<hr/>

V.

LOCAL RAILWAY PROJECTS IN 1845.

IN 1845 three distinct schemes were proposed for railway extension in this part of the country. The late Mr Edward Nixon of Barnard Castle proposed a scheme for a line to be called the Barnard Castle and Darlington Junction Railway, with a capital of £150,000, in 15,000 shares of £10 each.

Mr Nixon was unable to form a provisional committee, and so got no further than issuing the prospectus. The other two schemes were not promoted by local interests and influence, but were taken up by other parties in order to obtain great trunk-lines. One was intended to form a main line between Newcastle and Liverpool, and the other was intended not only for a line between these two important places, but also to form part of a main line between London and Glasgow. The first was called the Northumberland and Lancashire Junction Railway. The proposed capital was £2,000,000 in 100,000 shares of £20 each, and the provisional committee numbered eighty-two gentlemen of wealth and high standing, amongst whom were James Allison, Mayor of Sunderland; Pudsey Dawson, Hornby Castle, High Sheriff of the county of Lancaster; the Mayor of Gateshead; Thomas Colpitts Grainger, M.P.; the Mayor of Richmond; the Sheriff of Newcastle-upon-Tyne, &c. The local agents were the late Mr Thomas Wheldon, and Mr J. D. Holmes, of Barnard Castle.

According to the prospectus, the railway was to commence at Newcastle-upon-Tyne, uniting with the Newcastle

and Carlisle, the Newcastle and Darlington, and the Newcastle and Berwick Railways, at that town. It was then to proceed thence along the valley of the Team and Chester-le-Street to Durham, approaching within a convenient distance of that city. From Durham it was to proceed to Bishop Auckland, which, with the surrounding populous mining districts, did not then possess any direct railway communication with the North, and none whatever with the West. Passing by Bishop Auckland, Saint Helen's, and West Auckland, through the centre of the coal country, it was to go by Barnard Castle, and from thence by Bowes to Kirkby Stephen, in Westmorland, and join the Lancaster and Carlisle line near Tebay, a few miles north of the town of Kendal.

It was proposed by this line to cross the Tees about Towler Hill, then to pass through Startforth, and by way of Galley Hill into the valley of the Greta. This company made the survey, deposited plans, and served the usual notices to the landholders. They did not, however, make a deposit of capital required by the standing orders of Parliament, and withdrew their Bill. It is said they were thus actuated through fear of having to compete with the third project—the York and Carlisle. The Northumberland and Lancashire Junction was not supported by the inhabitants of Barnard Castle, because it was felt that it passed too far from the town.

VI.

THE RAILWAY JUBILEE.

THE jubilee of the opening of the first public railway will be held at Darlington on the 27th of September 1875. Written as these lines are some weeks antecedent to the auspicious event, it is impossible to furnish a complete programme of the celebration; but it nevertheless comes within the scope of this work to indicate, as far as the available information will allow, the extent and nature of the arrangements.

The idea of celebrating with becoming pomp and circumstance the jubilee of the opening of the Stockton and Darlington Railway was first mooted to the directors of the North-Eastern Board in the early part of this year, while they were holding a meeting in London. Mr Henry Pease was the projector of the idea, and on his recommendation the directors resolved that "this Board has been reminded that the fiftieth anniversary of the opening of the Stockton and Darlington Railway—the first public railway in the kingdom—will take place on the 27th of September next. In consideration of the importance of the event, the directors are of opinion that it should be celebrated in a suitable manner, and they accordingly appoint a committee to take the matter into consideration, and carry out the provisional arrangements." The committee consisted of Mr I. L. Bell, Mr H. Pease, Mr Kitson of Leeds, Mr Isaac Wilson of Middlesbrough, Mr Elliot (late High Sheriff of the county of Durham), Mr G. Lee-man, Mr W. C. Copperthwaite, Mr W. R. Hunter, Mr A. Kitching, Mr J. W. Pease, Mr H. F. Pease, Mr W. Thompson, Mr A. Pease, Mr W. C. Stobart, Mr Pease, Mr Arthur

David Dale, and Mr W. R. I. Hopkins. Most of these gentlemen took little active part in the preliminary arrangements, which were left in the hands of Mr Henry Pease, Mr David Dale, Mr Arthur Pease, Mr H. F. Pease, and Mr John Edward Macnay, as secretary. The resolution to celebrate the jubilee was confirmed at the ordinary half-yearly meeting of the shareholders of the North-Eastern Railway Company, held at York in the following August, and towards the latter part of that month the preparations were in full swing.

A railway jubilee is an event of a character so unique that there is no precedent to guide those who are concerned in its celebration. It was, however, determined that the programme should mainly embrace the following items :—

1. The unveiling of the statue of Mr Joseph Pease, the first treasurer of the Stockton and Darlington Railway, and the first Quaker member returned to the House of Commons.
2. The presentation of a portrait of Mr Joseph Pease, to be placed in the Council Chamber.
3. A banquet on the evening of Monday the 27th September.
4. An exhibition of locomotive engines and other objects of interest in connection with railways.
5. Excursions to places of industrial, topographical, or antiquarian interest on the 28th September."

It will thus be seen that the celebration is to extend over two days. On the 27th September, the statue of Mr Pease will be unveiled, and the banquet will take place. The exhibition of locomotive engines will also be open. On the same day, the presentation of Mr Pease's portrait will be made to the town, and next day the principal works in the district will be open for the inspection of visitors.

It is nearly a year since the proposal to establish a memorial to the late Joseph Pease originated. A meeting of the promoters and friends of the movement was held towards the close of 1874, and appointed a committee—with Mr Richard Luck as chairman, and Messrs Jonathan Backhouse and J. E. Macnay as joint secretaries—to collect subscriptions and make other necessary arrangements. On

the 4th of January 1875, that committee issued a circular soliciting subscriptions to the memorial, and mentioning that "the central committee, to whom was entrusted the duty of determining the form of the memorial, has decided on the erection, in the town of Darlington, of a statue by an eminent sculptor, and the execution by a first-rate artist of a portrait to be placed in the borough hall of Mr Pease's native town. These will, it is estimated, cost about £3500. Towards this sum considerable contributions have been received, but it is desired to afford the opportunity of contributing to all (wherever resident) who appreciated the eminent public services, talents, and virtues of Mr Pease, and who desire to see them recognised in some appropriate and enduring memorial." The execution of the statue was placed in the hands of Mr Lawson of London, while the painting of the portrait was given to Mr James Macbeth, son of Norman Macbeth, the well-known Scotch painter. The statue is erected in the principal thoroughfare, opposite the King's Head Hotel, on what is undoubtedly the best and most commanding site for the purpose. The portrait will be placed in the Council Chamber.

Of the banquet, it may safely be pronounced, within a fortnight of its celebration, that it will be one of the largest and most successful that has ever been held in the North of England. There was no room in Darlington large enough to hold the number of guests which the railway company proposed to invite, and hence it was arranged to have a tent built specially for the occasion, and erected in the cricket-field off Victoria Road. Mr Benjamin Edgington, of Duke Street, London Bridge, was entrusted with the making of the marquee, the dining portion of which is 185 feet long by 80 feet wide, while there is an adjoining reception-room 120 feet in length by 25 feet wide. At one end of the dining-tent there is a ladies' gallery, and at the other an orchestral gallery. The banquet will be purveyed by King & Brymes (late Birch & Birch), who purvey the Lord Mayor's banquets at the Guildhall. The list of invitations

is varied and numerous, embracing the chairmen and secretaries of all the principal railway companies in the world, the members of Parliament, bishops, mayors, and town-clerks on the North-Eastern system, representatives of the Chambers of Commerce, and the principal industries in the North; and last, but not least, the members of the present Cabinet, and the members of the Government of Mr Gladstone.

The local committee made arrangements for presenting each guest with a copy of this volume as a souvenir of the event.

But although the jubilee was one in which the North-Eastern Railway Company had the most direct interest, as the owners of the first public line, it has not been reserved for them to incur all the cost or manifest all the jubilation. The Darlington people as a whole showed themselves alive to the exceptional interest and importance of the event; and the corporation, at a meeting held on Thursday, September 2d, passed the following resolution:—

“The Council has under consideration the fact that on the 27th of this month will occur the fiftieth anniversary of the opening of the Stockton and Darlington Railway, and the Council learns with pleasure that the North-Eastern Railway Company is making extensive preparations for the suitable celebration of the event at this place. Resolved, 1st, that the system of public railways having had its origin at Darlington, the Council deems it its duty to co-operate with the North-Eastern Railway Company, or any other parties seeking to render the celebration as worthy and attractive as possible. Resolved, 2d, that inasmuch as there will probably be a large influx of strangers from considerable distances, such of the inhabitants as can suitably do so are encouraged to offer all the accommodation, hospitality, and civility in their power. That a copy of these resolutions be sent to the North-Eastern Railway Company, and advertised as the committee may determine.”

It was afterwards resolved to place a large sum of money at the disposal of the Mayor for the purpose of suitably maintaining the dignity of the town, and manifesting its interest in the occasion. Arrangements have also been made by the friendly societies of the town and kindred organisations for taking part in the proceedings, while

it is proposed to make the 27th, if not also the 28th of September, a general holiday.

The exhibition of engines, held at the North Road Engine Works, will be one of the most interesting that has ever been brought together. These works are very well adapted for the purposes of such an exhibition. They are admirably laid out, of large extent, and otherwise suitable for such a display. It is proposed to have most of the locomotives shown in the erecting shop, which is capable of holding upwards of forty engines altogether. The interest of visitors to this exhibition will no doubt be chiefly centred in old "Locomotion," the first engine used on a public railway. It was built by R. Stephenson & Company of Newcastle, at a cost of £500, along with a companion called "Hope," which was destroyed a number of years ago. It ran from 1825 till 1850 on the Stockton and Darlington Railway. In the latter year it passed into the possession of Messrs Joseph Pease and partners, by whom it was used for colliery purposes until 1857, when it was placed on the pedestal built for its reception, opposite the Darlington Railway Station—Mr Joseph Pease, Mr Henry Pease, Mr John Dixon, and Mr Macnay being among those who took part in the ceremony. "Locomotion" has a plain straight boiler, 10 feet long by 4 feet diameter, one through tube 2 feet diameter, and 1 safety valve, which gave a working pressure of 25 lbs. per square inch. The firegrate is placed at one end of the tube, which gives a total heating surface of 60 square feet. It has two cylinders, each 10 inches diameter, and a 24-inch stroke, placed vertically on the top of the boiler. It has two large cross-beams (now called cross-heads) coupled to connecting rods, which work down by the side of the boiler, and are coupled to crank pins in wheels at right angles. These crank pins are kept at right angles by side rods. It has four metal wheels, 4 feet diameter, and two flat slides, which are worked by a loose eccentric sheave and bell cranks. It has also a 4-inch pump, worked from a

cross-head on the piston. The tender has four metal wheels, each 2 feet 6 inches diameter, with a small square tank on the top capable of holding about 240 gallons of water. The frame is made of wood, and there is no brake on. The engine could haul twelve wagons at a speed of eight miles per hour. Its weight in working order is $6\frac{1}{2}$ tons, and it is of sixteen nominal horse power.

There are none of the Stockton and Darlington Railway engines built between 1825 and 1839 available for exhibition. The records of the company show that between 1825 and 1830 there were no fewer than eleven new engines built, chiefly at Stephenson's Works, Newcastle. In 1831, five new engines were added. The total number of engines then in the possession of the company was eighteen. In 1832 and 1833, "Lord Brougham," "Shildon," and "Lord Durham," were added to the list; in 1834, the "Majestic," and in 1836 the "Enterprise" and "Swift"—the two latter having been built by Alfred Kitching. In 1837, Timothy Hackworth built the "Bee," which cost £1300; and in 1842, the "Leader," "Middlesbrough," and "Auckland," which cost £900 each. The "Tees," built by A. Kitching in 1840, cost £1950. In 1841, Messrs Fossick and Hackworth built the "Stockton," and Messrs Neasham and Welch built the "Witton Castle" in the preceding year. Up to 1842, other engines were built, including the "Whig," in 1838, by A. Kitching (cost £800), and the "Darlington," in 1832, by William Lister. All of these engines, however, have either been broken up or lost sight of—more than a dozen of them having been destroyed a few years ago at the Shildon Works. Hence, there will be no engine illustrative of the period between 1825 and 1839, in which latter year the "Auckland" was built by T. Hackworth at the Shildon Engine Works.

The "Auckland (10) is a tube engine, and is still in use. It was sold some years ago to the Consett Water Company, and it is now employed by them for carrying purposes. It has a number of structural peculiarities which will now

attract the attention of engineers, although it is in many respects an improvement on its older colleague, "Locomotion." Perhaps its more remarkable features are its Napier boiler—that is, a boiler with a single main flue and a return-pipe—and its wood tender at the fire end with four wheels, each 2 feet 6 inches diameter. The engine has six wheels, each 4 feet diameter, and coupled with side rods. It has a water tank, square at one end, with four wheels, each 2 feet 6 inches diameter, and is fitted with an ordinary brake. The tender is capable of holding about three tons of fuel.

The "Shildon" (1033) was constructed thirty years ago at the Shildon Locomotive Works by Mr William Bouch. It has been running continually since that time on the Stockton and Darlington line, and is yet, to all appearance, fit for a good deal of service. It has a Napier boiler with one tube. It has two cylinders, each 15 inches diameter, and a 24-inch stroke. The driving wheels are six in number, coupled, and each 4 feet diameter. It is fitted with "gab-gear," which was characteristic of all the earlier engines made previous to the introduction of the expansion link. Of this gear it may be remarked, that it not only caused the loss of a great deal of steam, but it prevented the easy reversal of the engines.

The "Dart" (1041), constructed by Timothy Hackworth at Shildon thirty-six years ago, is a fire-box engine, with two inside cylinders, each 12 inches diameter, and 18 inches stroke. It has four driving wheels, each 4 feet 6 inches diameter. It is worked at a boiler pressure of 60 lbs. per square inch. It has two pumps, worked from cross-heads or motions, one crank axle, and one plain axle. The tank has four wheels, each 2 feet 6 inches diameter, and a wooden frame, with a small iron tank on the top.

The "Meteor" (1050) is a passenger engine built at the Shildon Engine Works in 1843. It has two inside cylinders, each 12 inches diameter, and an 18-inch stroke. It has a boiler pressure of 100 lbs. per square inch. There is one pair of driving wheels, each 5 feet diameter, a pair of

leading wheels 3 feet diameter, and a pair of trailing wheels 3 feet diameter. It is fitted with two pumps. The boiler is 10 feet long and 3 feet 6 inches diameter, and contains 117 tubes, each $1\frac{3}{4}$ inches diameter, made of iron. The fire-box is of copper, 4 feet 6 inches, by 3 feet 6 inches, by 3 feet 6 inches.

"Woodlands" (1058) is another passenger engine, which was built by Alfred Kitching in 1848, and is at the present time carrying passengers on the Stockton and Darlington line. It has two inside cylinders, each 16 inches diameter, and a 20-inch stroke. It has four wheels coupled, 5 feet diameter, and a pair of leading wheels in front, 3 feet 6 inches diameter. It has one crank axle, and two straight axles. The boiler is 12 feet in length, and 3 feet 6 inches diameter. It contains 129 wrought-iron tubes, $1\frac{7}{8}$ inches diameter, and is worked at a pressure of 120 lbs. It has two pumps, and can attain a speed of thirty-five miles per hour with five or six carriages. The weight of the engine is about 25 tons. It has a six-wheeled tender, with wheels about 3 feet 6 inches diameter. The tank is made of $\frac{1}{4}$ -inch plate, and will hold about 1200 gallons of water and three tons of fuel. It is fitted with an ordinary screw-brake, and a block attached to each wheel. The tank in working order weighs 16 tons. The fire-box is similar to that of No. 1050.

"Southend" (1062) is an engine made by Gilkes, Wilson, & Co. in February 1849. It is still at work on the Darlington Section. It has a boiler 13 feet long and 4 feet diameter, fitted with 162 Low Moor iron tubes, each two inches diameter. It is furnished with a copper fire-box, 4 feet 6 inches high, and 3 feet 8 inches long by 3 feet 6 inches wide. It has two inside cylinders, each 15 inches diameter and a 24-inch stroke. The boiler pressure is 110 lbs. The engine is coupled on six 4 feet 6 inch metal wheels. It has one crank axle, two straight axles, and two pumps. The tender has six wheels, each 2 feet 6 inches diameter—T spoked, with metal bosses. The tank is

made of $\frac{1}{4}$ -inch plate, and will hold about 1500 gallons of water and four tons of fuel. It is fitted with an ordinary screw-brake, and a block on each wheel. The weight of the engine in working order is about 28 tons, while that of the tender is about 15 tons.

"Priam" (1066) is an engine made at the works of Gilkes, Wilson, & Co., Middlesbrough, in November 1847. It has two outside cylinders, each 15 inches diameter, and a 22-inch stroke. It is coupled with four 5-foot wheels, and a pair of leading wheels in front, each 3 feet 6 inches diameter. It has four eccentrics and two expansion links. The boiler is 14 feet long by 3 feet 6 inches diameter, and has 125 iron tubes, each 2 inches diameter. It has two pumps, and works with a boiler pressure of 95 lbs. The weight of the engine in working order is 28 tons. The tender is similar to 1062.

"Duke" (1080), made at the Shildon Works in 1854, is still at work on the Darlington Section. It has two outside cylinders, each 18 inches diameter, and an 18-inch stroke. The boiler is 14 feet in length, and 4 feet diameter. It is made of $\frac{3}{8}$ -inch Low Moor iron plate, and contains 158 Low Moor iron tubes, each 2 inches diameter. It has a copper fire-box, 5 feet 8 inches high, by 3 feet 6 inches, by 4 feet. It has six 3 feet 6 inch coupled wheels, four eccentrics, two expansion links, two pumps, and works at a boiler pressure of 120 lbs. The tender is similar to that of No. 1066.

"Hawthorn" (1082) was made by R. & W. Hawthorn of Newcastle in July 1854, and is at work yet. It has a pair of 16-inch inside cylinders and a 24-inch stroke. The boiler is 10 feet long by 4 feet diameter, and is worked at a pressure of 100 lbs. It contains 135 Low Moor iron tubes, each 2 inches diameter. This engine is fitted with six 4-foot wheels, one crank axle, two plain axles, four eccentric sheaves, two expansion links, outside frames, and weighs in working order about 26 tons. The tank is similar to that of No. 1062.

"Albert" (1084) was made by Gilkes, Wilson, & Company in July 1854, and is at present at work on the Darlington Section. It has a boiler 14 feet long, 4 feet diameter, made of $\frac{3}{8}$ -inch Low Moor iron plate, and furnished with 158 tubes, each 2 inches diameter. It has two inside cylinders, each 17 inches diameter, and an 18-inch stroke; six 4-foot wheels, coupled, one crank axle, two straight axles, four eccentrics, two expansion links, and a boiler pressure of 130 lbs. Its weight in working order is 31 tons.

Between 1854 and 1874 a large number of engines are exhibited, which we are compelled to pass over very briefly. They include No. 1160, a bogie passenger engine, built by R. Stephenson & Company, Newcastle, in April 1860, and costing £2370; and 1221, built by Hawthorn in August 1860. No. 1270 is a bogie passenger engine, designed and built by Mr William Bouch, at the North Road Engine Works, Darlington, in November 1874, for working passenger trains on the steep gradients between Darlington and Tebay. Its boiler is 10 feet long by 4 feet diameter, made of Low Moor plate, $\frac{7}{16}$ of an inch thick, jump-jointed, and put together with hoops and four zigzag rows of rivets. The rivet-holes are all drilled, instead of being punched. It has a copper fire-box, 5 feet 9 inches high, 4 feet 5 inches long, by 3 feet 10 inches wide. It contains 210 Low Moor iron tubes $1\frac{1}{2}$ inches diameter, giving it a total heating surface, including the fire-box, of 1217 square feet. There are two outside cylinders, 17 inches diameter, and a 30-inch stroke. The slide-valves are pistons, 13 inches diameter, worked by eccentrics and expansion links, and fitted with patent screw-reversing gear, first designed and applied by Mr William Bouch at the North Road Engine Works in December 1864. There are four driving wheels, coupled, each 7 feet diameter, and a four-wheeled bogie, each wheel 3 feet 6 inches diameter, the total wheel-base being 21 feet. The engine is fitted with Bouch's patent steam-retarder, which acts on the cylinder pistons as a brake; there is also a hand-screw

brake on the back wheels. The boiler pressure is 140 lbs. per square inch, and the engine can attain a speed of about sixty miles per hour, with about fourteen passenger carriages, the total weight of the engine in working order being forty-two tons. The nominal horse power is 700, and the consumption of fuel about 28 lbs. per mile. The tender attached to this splendid engine has six malleable iron wheels, each 4 feet diameter, with Monk Bridge weldless iron tyres on, the total wheel-base being 10 feet. It has two iron frames, each 16 feet 4 inches long, by 3 feet broad and $\frac{3}{4}$ inch thick, fitted with six carrying springs hung underneath the axle-boxes. The tender is made of $\frac{1}{2}$ -inch plate, and will carry 2400 gallons of water and six tons of fuel. The weight of the tender in working order is twenty-three tons. It is fitted with an ordinary screw brake and a wood block on each wheel.

No. 1291 was constructed this year at the North Road Engine Works. It has two inside cylinders, each 17 inches diameter, and a 26-inch stroke. The boiler is 11 feet long by 4 feet diameter, and is made of Low Moor iron plate, $\frac{7}{16}$ inch thick, and double riveted with zigzag rows. It contains 158 Low Moor iron tubes, each 2 inches diameter. It has inside motions, two flat slides, working by four eccentrics and expansion links, six 5-foot wheels, coupled with side rods, one crank axle, made of Bolton steel, a pair of wheels behind the fire-box, two of Freedmann's injectors, Bouch's screw-reversing gear and steam-retarder, and a boiler pressure of 130 lbs. per square inch. It can attain a speed of forty miles per hour, with forty 10-ton trucks of coal, has a nominal power equal to 650 horses, and has a tender with six malleable iron wheels, the same as No. 1270. This engine was made in seven days.

No. 1068 is a passenger engine, built at the North Road Engine Works in August 1875. It has two inside cylinders, each 17 inches diameter, and a 26-inch stroke. Its boiler is 11 feet long by 4 feet 2 inches diameter, made of Low Moor plate, $\frac{3}{8}$ inches thick, double riveted, with zigzag

rows, the rivet-holes being all drilled. It is furnished with 158 Low Moor iron tubes, each 2 inches diameter, giving a total heating surface, including the fire-box, of 1000 feet. It has two plain slides, worked by eccentrics and expansion links, is fitted with Bouch's screw-reversing gear, and has four driving wheels, coupled, each 6 feet diameter, one pair of leading wheels in front, each 4 feet diameter, and a total wheel-base of 16 feet 6 inches. It has one crank axle, made of Bolton steel, and is fitted with Bouch's steam-retarder, and a hand-screw brake on the trailing wheels. The boiler pressure is 140 lbs. per square inch. This engine can attain a speed of 60 miles per hour, with about fourteen carriages attached. Its weight in working order is 31 tons, and its power is nominally that of 520 horses. The tender is the same as 1270.

Having furnished a fairly representative account of the different types and styles of engines exhibited, it is unnecessary that we should carry these remarks further. Up to June 1868, the total number of engines built for the Stockton and Darlington Railway was 220. Between March 1863—when operations were first commenced—and the present time, the North Road Engine Works have produced 102 locomotive engines, the great majority of which have been of the largest size. The total number of engines now belonging to the Darlington Section is about 290, of which about 260 are regularly in use.